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A COMPUTER-ASSISTED LANDSAT INSTRUCTION PROGRAM FOR SOCIAL STUDIES EDUCATORS

by

LEE GRANT KENNEDY ARMSTRONG

A THESIS

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The undersigned certify that they have read, and recommend to the Faculty of Graduate Studies and Research, for acceptance, a thesis entitled A Computer-Assisted Landsat Instruction Program for Social Studies Educators submitted by Lee Grant Armstrong in partial fulfilment of the requirements for the degree of Master of Education in Elementary Education.

ABSTRACT

This study involved the design, development, implementation, and evaluation of a computer-assisted instruction (CAI) program for social studies teacher education. The program instructed education students in Landsat satellite infra-red false color image interpretation.

The Landsat CAI program 'Omega' recorded each student's performance as he or she progressed through the program. This information was used to provide student feedback and to improve the design of the program to enhance the learning experiences of subsequent groups of students.

The results of the study indicated that students can learn to interpret Landsat satellite infra-red false color images with the aid of computer-assisted instruction. The findings also indicated that the majority of students who participated in the study expressed highly favourable attitudes toward the CAI program.

The conclusions reached in this study suggest that CAI may have potential benefit for social studies teacher education, in general and that more research is needed over a longer period of time with a larger sample to determine the implications of this type of training. Specific research problems for further investigation were suggested.

ACKNOWLEDGEMENTS

This writer wishes to thank his supervisor, Dr. Joseph M. Kirman for his guidance and encouragement so willingly given throughout this study. Thanks are also extended to the other members of my thesis committee, Dr. Don Massey and Dr. Marshall Nay for their constructive comments and sincere interest in this study.

Special thanks go to the staff of the Division of Educational Research Services who provided technical and moral assistance when I needed it, including Dr. Steve Hunka, Myron, Thomas, Billy, Dewight and Don.

This writer also acknowledges his gratitude for technical assistance provided by Cal Bricker and his most competent administrative assistant, Heather, all of the Alberta Remote Sensing Center.

Finally, I would like to thank Barb and Sheri for maintaining their cheerful disposition and efficiency while typing and proofreading many drafts.

DEDICATED

To Dad, who always claimed I could never do it

To Mom, who always knew I would

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CHAPTER I

> Man must rise above the earth to the top of the atmosphere and beyond - for only thus will he fully understand the world in which he lives.
>
> (Socrates - 500 B.C.)

It took mankind over 2,000 years to confirm the validity of Socrates' statement. Today, with the aid of modern technology, man has indeed risen above his atmosphere, visited the moon and circled the globe. Since the launching of Sputnik in 1957, virtually thousands of satellites have been launched into space providing scientists with timely and accurate data about our environment, urban planning, geology, water resources and agriculture.

Socrates is also important for another reason. Father of the "Socratic" method of instruction, he individually taught his students by using a method of question and answer in what is now generally regarded as the highest form of individualized instruction. In the past, educators have tried to achieve the ideal of individualized instruction for every student. Contemporary educational researchers are still trying to achieve that goal. However, given current time, space and staff limitations facing most institutions of higher learning as a result of budgetary cutbacks, it is unlikely that the ideal pupil teacher ratio of 1:1 will ever be achieved.

Recent developments in computer-assisted instruction (CAI) would suggest however, that students can be taught individually in large groups at low cost. The introduction of CAI is not intended as a way of improving the instruction that takes place in the traditional classroom, but to provide an alternative to it.

The application of computer-assisted instruction to the field of social studies is relatively new. This feasibility study - computer-assisted land satellite imagery interpretation, is the first of its kind in map skill training in Canada.

The basic purpose of this study is to generate preliminary data with a limited sample of participants to determine the feasibility of carrying out further definitive research on the topic.

The various aspects of the problem under investigation are discussed in chapter one. Included in that chapter are the purpose of the study, definition of terms, rationale, implications for social studies, and delimitations of the study. Chapter two presents a review of the literature pertinent to the problem under investigation.

The third chapter deals with procedures and research design. Chapter four contains the results of the study and discussion of the findings. The last chapter presents the conclusions and recommendations for future research.

THE PROBLEM

1. Purpose of the Study

The objectives of this study were to design, develop, implement and evaluate a computer-assisted instruction (CAI) program to teach pre-service teachers the fundamentals of Landsat satellite infra-red false color image interpretation.

The study involved the authoring of a computer-program to achieve the following objectives:

1) to develop a computer-assisted instruction course in Landsat satellite infra-red false color image interpretation, and

2) to determine if students could learn to interpret infra-red false color Landsat images with the aid of CAI.

II. Definition of Terms

Cathode Ray Tube (C.R.T.) the television like tube on which the text of all the material presented to the student is displayed; is often referred to as the screen.

Computer Assisted Instruction (CAI) is the name given to a teaching process which makes extensive use of a computer in presenting, testing and interacting with the student.

Constructed Response refers to the type of response whereby the subject fabricates or constructs his answer with external cues. This is in contrast to the multiple choice type of response where the answer is already constructed for him and he has only to recognize the response from a set of alternatives.

Composite False Color refers to the color produced on Landsat maps composed of data derived from different satellite spectrum scans of the same area.

ERTS - Earth Resources Technology Satellite formerly the name of Landsat satellites.

Infra-red False Color refers to that portion of the spectrum corresponding to infra-red, and used to delineate green vegetation on Landsat maps.

Landsat Map refers to a representation of the land surface of the earth produced with the aid of a Landsat satellite.

Landsat refers to Landsat satellites, scanning the surfaces of the earth from an attitude of approximately 929 km. high.

Non Visible Light Spectrum refers to that portion of the light

spectrum not visible to the human eye.

Near Polar Orbit refers to the orbit of a satellite where the path is nearly over the earth's poles.

Visible Light Spectrum refers to that portion of the light spectrum visible to the human eye.

III. Rationale

The need for better programs of pre-service and in-service education has been widely acclaimed in the literature related to professional growth in education. Hass (1957) demonstrated the need for in-service education in a discussion of factors such as rapid accumulation of academic and professional knowledge, the rapid cultural changes which characterize modern times, and the importance of making it possible for excellent teachers to make use of their creative abilities (pp. 13-34). Taba (1965) emphasized the need to revise current in-service practices. Among the implications Taba discussed, was a caution that providing content background to teachers without a simultaneous effort at instructional implementation does not assure that the background will be used in instruction, except perhaps in transmitting to students this knowledge in practically the same way it was received (p. 466).

In social studies teacher education, the last decade has produced a wide variety of instructional methods including the discovery, inquiry method, mastery learning, simulation and games. While it is true that such methods are currently valid, current research on social studies teacher education points out that "teacher educators are likely to use and rely on lecture and recitation methods in their

own classes" (Masemore, 1973, p. 97). Massialas and others have stated that the low interest of social studies teacher educators in research is to be lamented. It would appear then, that drastic surgery is needed if we are to maintain the interests of our students in our social studies programs (1975).

Given the current state of the art, it seemed reasonable to this writer to search out alternative models of social studies pre-service teacher education. Two relatively recent advancements in modern technology used together would seem to provide an acceptable alternative to traditional modes of instruction.

Landsat satellite maps are a new social studies resource and the accuracy and timeliness of these maps as well as their potential uses will help better prepare the teacher to understand and teach about our planet. In addition, the use of computer-assisted instruction to teach about Landsat satellite images will expose pre-service teachers to an alternate mode of instruction while at the same time demonstrating its potential in the field of social studies.

IV. Implications for Social Studies

The two most important characteristics of Landsat maps for social studies is their accuracy and timeliness. The ability to work with Landsat maps provides an excellent opportunity to examine timely accurate data on the natural resources of our environment. The identification of crops, detection of plant diseases, location of fresh water supplies, forest and wild life management, surface geology, sediment transport and the movement of ice are only a few of the interesting features that provide a new dimension of study for social

studies. Finally, an introduction to Landsat satellite image interpretation and CAI as a mode of instruction will enlarge the teaching repertoire of teachers.

The application of computer-assisted instruction to a wide variety of disciplines other than social studies is well documented (Hunka, 1978). The possibility of applying CAI to content areas in social studies merits examination.

V. Delimitations of the Study

1) This study was limited to a sample of twenty-two pre-service teachers enrolled in a senior social studies Curriculum and Instruction (Ed. C.I.) 413 course offered by the University of Alberta's Faculty of Education in the 1979 fall session.

Three factors contributing to the number of students in the sample were:

a) The number of terminals available for use was limited by the heavy scheduling of other CAI courses by the Division of Educational Research Services.

b) The difficulty of arranging a terminal time to suit students who were carrying more than one course.

c) Time limitations imposed by other course requirements.

2) The use of infra-red false color images.

CHAPTER II

Review of the Related Literature

Computer-Assisted Instruction (CAI)

1. Computers and their use in Education

Computers and their use in the field of education are not a recent phenonemon. In the last decade there has been a steady flow of literature describing various studies where computer-assisted instruction has been applied to a given education situation (Hunka, 1978, p. 29).

The most important fact about computers is that they are here to stay and are not likely to go away. Third generation computers have come and gone since the computer genesis twenty years ago and the 'mini-computer' has signalled the arrival of the fourth generation computers in North America.

Thimbeley (1976: 241) noted that the computer is the only commodity that is steadily decreasing in cost while all others are steadily rising. Commenting further, Thimbeley noted that since the performance to cost ratio of mini-based systems in particular has increased by such a dramatic amount in the past five years, it is doubtful whether the costs of computers is a serious barrier to their use in the classroom - academic inertia appears to be the main obstacle (Thimbeley, 1976; p. 245).

2. Advantages of Computer-Assisted Instruction

Magidson (1977: 5) stated very succintly that the educational promise of CAI lies in its ability to individualize and personalize

the instructional process and to simulate experiences not readily available. Continuing, he described some of the advantages of computer-assisted instruction:

> CAI lessons can serve as text, test and tutor while compelling students to be active participants in their own learning. Students can work at their own pace while their CAI program monitors their progress. Students are kept informed of their progress through immediate feedback and achievement summaries. Students have varying amounts of control over their learning in that they can review previous instruction, request special help, or continue on to enrichment activities. The instruction can be systematically prepared, sequenced, tested and revised (Magidson, 1977, p. 5).

3. CAI Instructional Strategies

Considerable dialogue has been generated among educators over the advantages of CAI versus traditional modes of instruction. Most CAI courses are currently being used to supplement and compliment traditional instruction, not to replace it, which makes it extremely difficult to compare CAI and traditional instruction. However, the learning theory underlying the instructional strategies of both modes of instruction is remarkably similar. Both CAI and traditional modes of instruction make use of Bloom's taxonomy of educational objectives.

With CAI, the specification of educational objectives and the application of learning theory to the following instructional strategies is paramount:

1) Drill and Practice - this mode of instruction has proved to be the most widespread, probably because it is the easiest to prepare and can be used to free teachers from the drudgery of making up and checking practice exercises.

2) Tutorial - in the tutorial mode, students are presented with instruction interspersed with

appropriate questions. Question formats are commonly multiple-choice, matching, fill in, and short answer. Sophisticated CAI systems can catch or allow for misspellings, judge as correct a variety of possible answers and even allow students to touch portions of the display to elicit a computer response.

3) Simulation - the simulation mode is perhaps the most exciting for it can allow the student to use the computer as a tool to discover and generate new information i.e. educational games (Hicks and Hunka, 1972, p. 67).

The hierarchy of capabilities that can be established by learning as described by Gagne (1974) are also incorporated into the CAI instructional strategies.

4. The Effectiveness of CAI

A goodly number of studies have been published attesting to the effectiveness of computer-assisted instruction (Hunka, 1976, p. 6). The majority of these publications cite the following reasons as to why CAI related learning can be useful:

a) evidence of student achievement

b) evidence of increased institutional productivity

c) a variety of applications in many subjects and courses

d) the teaching of computer literacy (uses and impact of computers)

e) an outstanding computer science or data processing program, and

f) an impact on other people and institutions (Kulik, JA and P. Jaska, 1977, pp. 12-19).

Published studies comparing the effectiveness of CAI to traditional instruction report conflicting results but generally conclude that CAI is more effective (fifty-five percent) than traditional instruction

(Kulik and Jaksa, 1977, p. 7). Almost all of these studies reported that students using CAI had highly positive attitudes toward their learning and that CAI learning requires less time.

Magidson (1978) conducted an extensive study of student attitudes toward the 'Plato' CAI system and reported the following results:

1. Students who used Plato were highly positive in their assessment of the system
2. They did not believe CAI to be dehumanizing
3. They found its use helpful as a learning aid
4. They spent some of their free-time using it
5. They enjoyed using Plato, and
6. They experienced only minor difficulties operating the terminals and they believed computer and terminal breakdowns posed minor difficulties

5. Problems Associated With CAI

Without doubt, the effectiveness of CAI is dependent upon the quality and reliability of hardware, software and courseware. Following are some of the problems generally encountered by students using CAI as reported by (Ofiesh and Meierhenry, 1974, pp. 207-210).

1. Difficulty in operating terminals
2. Computer and/or terminal breakdown
3. Insufficient terminal time at a single setting
4. Poor scheduling of CAI time
5. Difficulty in reading information from the CRT screen
6. Poor lighting conditions, and

7. Insufficient introduction to the CAI operating system.

The foregoing would suggest that there is a strong need to train pre-service and in-service teachers on how best to use CAI and how to work with instructional developers and other content specialists in preparing new courses. Further, it is important that teachers and administrators be made aware of the capabilities of this technology especially where it has been demonstrated that this technology can improve the quality of education.

Satellite Images

The use of Landsat infra-red composite false color images is a new resource in social studies. Robbins (1966) provided a clear picture of the impact satellites would have on education. "Teachers will have to change their traditional method of teaching geography and social studies in order to keep pace with modern technology and to fully understand the world in which they live".

Recognition by the National Council for Social Studies of Landsat as an important resource in social studies came a decade later with the appearance of an article in Social Education by William P. Nixon and Richard E. McCormack entitled "Landsat: A Tool for Your Classroom" (1977).

Kirman (1977) studied the use of infra-red composite false color images with teachers of grades three, four and five. He concluded that teachers for those levels were able to understand and teach about Landsat maps to their children. However, the level of instruction appeared related to the background knowledge of the teacher (Kirman, 1977, p. 43).

It would appear that the use of Landsat images as a resource in the field of social studies is increasing as evidenced by the growing number of educational materials. The following materials are available for teacher use in the area of Landsat image interpretation:

1. Brosius, Craig, A., Gervin, Janette C., & Ragusa, James M. Remote Sensing and the Earth. Titusville, Florida: School Board of Brevard County, 1977, p. 472.

   This document was a cooperative effort between the Educational Programs Division of National Aeronautic and Space Administration (NASA's) Kennedy Space Center and the School Board of Brevard County, Florida. The document was developed to enhance student understanding of how remotely acquired data are obtained, analyzed and used. Activities for the senior high school student included map reading and analysis, characteristics of the visible spectrum and other areas relevant to remote sensing.

2. Kirman, Joseph M. Primer for Satellite Maps. Edmonton: Puckrin Publishing House, 1978, pp. 60.

   This is essentially a resource kit for Elementary school teachers to introduce Landsat into their classrooms. The kit includes composite false color images of selected areas of Canada and the world, slides and teachers' guide. Activities are aimed at introducing students to how the data is received, interpreted and used to help manage the environment.

3. Kopp, O.W. et al. Elementary School Aerospace Activities: A Resource for Teachers. Washington: National Aeronautics and Space Administration, 1977, pp. 127.

   This document was the result of a cooperative effort between

the Educational Programs Division of NASA and the Department of Elementary Education at the University of Nebraska-Lincoln. Through a resource book for elementary school teachers on aerospace activities, the student is exposed to a variety of activities concerning the use of unmanned satellites, Skylab, the management of resources and the significance to earth of space exploration.

4. Petrillo, Anthony J. What's the Use of Land? Washington: National Aeronautics and Space Administration, 1976, p. 57.

This is a secondary school social studies project, in which activities are geared to show how NASA's space observations can integrate with other data sources in environmental education.

5. Tindal, Margaret A. Constructing a Landsat Photomosiac Using Lattitude and Longitude. Greenbelt, Maryland: Goddard Space Flight Center, 1977, p. 10.

This publication aims to assist students to construct a photo-mosiac using latitude and longitude and sets of Landsat pictures.

6. Tindal, Margaret A. Educator's Guide for Mission to Earth: Landsat Views the World. Greenbelt, Maryland: NASA Goddard Space Flight Center, 1978, pp. 59.

This educator's guide is designed to accompany NASA publication Mission to Earth: Landsat Views the World. The teacher's guide is an effort to offer upper elementary and junior high school teachers some suggestions for using Landsat imagery in their classrooms. The materials included in the guide are organized around four broad content themes, namely 1) Earth Source-Geology; 2) Environmental Studies;

3) Geography; and 4) Social and Urban Studies.

7. Weinkauf, Ronald. Georgraphy on Landsat Images: Student Resources. Brookings, South Dakota: Ronald Weinkauf, 1976, pp. 22.

This is essentially a resource kit; activities aim at helping college level students understand how information about the earth is gathered from space, interpreted, and used to help manage our environment.

8. Vogt, Gregory L. Remote Sensing of the Earth with the Landsat Multispectial Scanner. Washington: NASA Lewis Research Center, 1977, pp. 28.

This is an activity guide to demonstrate how black and white and color satellite images are produced, transmitted to earth, and interpreted.

A mini-course series on the fundamentals of remote sensing is marketed by the Countinuing Education Administration of Purdue University in West Lafayette, Indiana. The series includes seven mini-courses, a study guide, audiotape and a set of slides. The Laboratory for Applications of Remote Sensing at Purdue, also has a program to provide digital analysis capabilities for remote sensing research.

The Educational Programs Division of the National Aeronautic and Space Administration in Washington has published a film catalogue of background audio visual materials. A number of technical publications by specialists in remote sensing have appeared on the market. These range from Dorothy Harper's Eye in the Sky: Introduction to Remote Sensing (1977) to the Manual of Remote Sensing (Ed.) Robert G. Reeves, published by the American Society of Photogrammetry. Vol. Theory, Irstruments and Techniques. Vol. 2 Interpretation and

Applications. Falls Church, Virginia, 1975. However, these documents are aimed at specialists in remote sensing and have limited appeal to educators.

While courses in remote sensing are being offered in thirteen Canadian Universities, all of them are offered by departments outside faculties of education and do not employ CAI as the mode of instruction.[3]

Here at the University of Alberta, pre-service and in-service teachers are introduced to Landsat image interpretation in Social Studies Ed. C.I. 212 and 413 classes. It appears then, that the University of Alberta is the only Canadian Institution offering instruction in Landsat image interpretation to students specializing at the elementary school level.

In 1979, Project Omega was formed under the direction of Dr. Joseph M. Kirman, Professor of Social Studies, Department of Elementary Education at the University of Alberta. Project Omega is an umbrella name for an on-going series of studies on remote sensing and applications in education. The scope of the project includes everything from training of classroom teachers and faculty of education undergraduates to the abilities of students to work with remote sensing technology.

There are currently three faculty members and one graduate student engaged in planning and research in Project Omega. Studies in progress include: children's perceptions of Landsat imagery; in-service Landsat training of science and social studies teachers by one-way television with telephone conferencing; capacities of students to work with black and white Landsat imagery; and a computer-assisted Landsat satellite interpretation instruction program.

Both the Alberta Remote Sensing Center in Edmonton, and the Canada Centre for Remote Sensing in Ottawa offer seminar type courses in remote sensing. However, their courses are geared to specialists outside the field of education and there are few teacher participants.

In summary, the review of the literature indicates that while computer-assisted instruction has been applied to a wide variety of educational disciplines, it is virtually absent in the field of social studies. Research on the effectiveness of CAI suggests that it is generally considered more effective than traditional modes of instruction but that there are a number of problems associated with CAI which students should be made aware of. Landsat infra-red composite false color images are a relatively new resource in social studies and where used, the traditional mode of instruction is employed. While there are courses offered in Remote Sensing at several universities, they are all, with the exception of the University of Alberta, not geared to the preparation of pre-service teachers. It would appear that this study - a computer-assisted instruction program in Landsat imagery interpretation for pre-service teacher training is the first of its kind.

CHAPTER III

Procedures and Research Design

I. The Sample

A sample of twenty-two students was obtained from a class of pre-service teachers enrolled in a senior course in social studies curriculum and instruction in the 1979 fall session of the Faculty of Education at the University of Alberta. All students participating in the study were enrolled as full-time undergraduates in the Bachelor of Education program.

II. Research Questions

For the purpose of this exploratory study, the following research questions were asked:

a) Is it possible to develop a computer-assisted instruction program to teach Landsat satellite map interpretation?

b) Can pre-service teachers understand and derive information from Landsat satellite maps with the aid of a computer-assisted instruction program?

III. Design and Development of the CAI Program

A. The Program Language

The writer undertook an independent course of study in computer-assisted instruction with the Division of Educational Research services in the Faculty of Education. The CAI course entitled "Coursewriter II" is designed to teach the coursewriter authoring language in approximately twenty-five hours of CAI terminal time including ten labs.

Upon completing the Coursewriter II course requirements, the writer commenced authoring the CAI Landsat satellite map interpretation program. The process consisted of the following eight stages:

1) Setting the objectives
2) Organizing the material
3) Preparing the material for the computer
4) Debugging the program
5) Trial sessions
6) Sessions with experimental group
7) Performance recordings
8) Documenting the program

B. Course Content

The material for the CAI course was gleaned from a number of different sources. The Alberta Remote Sensing Center in Edmonton and the Canada Center for Remote Sensing were particularly helpful in supplying pertinent literature.

The course was divided into ten segments. Each segment was broken down into topic areas. Following is a description of the topics which comprised the course:

A. Segment 1 - Introduction to remote sensing

B. Segment 2 - Landsat satellites

C. Segment 3 - Characteristics of wave bands

D. Segment 4 - Interpretation techniques

E. Segment 5 - Landsat imagery interpretation

F. Segment 6 - Winnipeg August image summary

G. Segment 7 - Winnipeg December image summary

H. Segment 8 - Image analysis equipment

I. Segment 9 - Remote sensing agencies

J. Segment 10 - Final review options

C. The Human Factor

In the design of the programs, some consideration was given to the 'human factor' element. In most cases, the design of man-machine systems has been the sole responsibility of hardware-oriented engineers who often use only economic or physical science criteria, rather than those of a psychologist (Baker, 1971). Failure to realize the importance of this element may lead to difficulties in the implementation of the computer programs:

> If the human factor is not properly valued, then morale problems after the system is operational may demand remediation. For example, if the task analysis of personnel in the training system result in overly specific and monotonous tasks, absenteeism, turnover, and other problems may result (Meany, 1972, p. 120).

Therefore, the design of this program was influenced by the need to personalize or humanize the nature of the course. For example, the student's first name was used in some screen displays of course material. In addition, the use of cartoons and humor were incorporated into the feedback messages of the program to help relieve any student monotony or boredom that might arise.

D. Debugging the Program

Five students volunteered to be tested on the CAI program in order to:

1) Debug the program, and

2) Check the instructional strategy

The debugging process was continued with a second trial group consisting of three graduate students and two professors: one from the Division of Educational Research Services responsible for the IBM/1500 CAI system; the other, a Professor of Elementary Education

specializing in social studies. A final trial run was made using twenty-two volunteers from a senior social studies course (Ed. C.I. 413) offered in the summer session in the Faculty of Education at the University of Alberta.

Once this latter group of students had completed the program, the author made final revisions to the program based on their respective comments and criticisms and removed any remaining technical errors prior to using it with the experimental group. While stage four is normally reserved for the debugging of the program, additional debugging took place in stages five through seven.

IV. Curriculum Kit

Thirteen curriculum kits were prepared for use at the terminal with the CAI program. The following materials were included in the curriculum kit:

1) Winnipeg composite false color image
   August 26th, 1976, path 33, row 25

2) Winnipeg composite false color image
   December 6th, 1975, path 33, row 25

3) Standard road map of Winnipeg

4) Transparent numbered grid for use with
   the above-mentioned images

5) Magnifying glass

The images and road map within the curriculum kit were laminated so that the materials could be used by subsequent students.

V. Administration of the Course

Each student with the experimental group signing on to the course was given a short introduction to the use of the computer terminal. Here the students received instruction in entering responses to

questions presented during the course, using both the light pen and the keyboard. During the terminal introduction, the program asked for the student's name which was stored and used later in the program.

The student was then given a brief introduction to the course itself. This section provided an overview of the course including the various topics in each of the ten segments.

The students were then instructed on how to branch to another segment in the course, should they wish to review. After each topic area had been covered, the student was given the opportunity to continue on to the next segment, or review the segment presented. The number of times a student made use of this learner control feature was recorded by the program. In addition to allowing the student to reinforce his comprehension of materials by reviewing, this feature also permitted the author to identify any weakness in instructional strategy and to revise the program accordingly.

Throughout the course, each student was asked a number of questions related to the course material. The student answered questions by typing a response on the keyboard, or by pointing at the answers with a light pen. The student had to enter a correct response to each question before being allowed to move ahead in the course. A student unsuccessful in obtaining the correct answer after two attempts, was given the correct answer and asked to type it in. The program kept a record of the number of questions to which the student had entered a correct response on the first and second attempt. If a student took too long in answering a question (timeout) or typed in an unrecognized response (UN), the program recorded his performance. This information was later used to improve the instructional strategy

and feedback messages in the program.

VI. Instruments

Four instruments were used in this feasibility study: a survey questionnaire prepared in cooperation with the Alberta Remote Sensing Center; an achievement test; a "Likert-type" attitudinal questionnaire and a written comment sheet prepared by the writer. All four instruments were administered by the writer.

The survey questionnaire and achievement test are subject to the following limitations:

1. No previous comparable studies have been found utilizing Landsat satellite maps with pre-service teachers.

2. The purpose of this study is to determine if the participating students are capable of understanding and deriving information from infra-red false color Landsat maps with the aid of a CAI program.

A. The Survey Questionnaire

A survey questionnaire consisting of thirteen questions was administered to the sample group in class one week before participating in the CAI program. An overhead transparency of an infra-red composite false color image of Edmonton and surrounding area, July 14th, 1974, path 45, row 23 was used with the survey questionnaire. A sample of the survey questionnaire with corresponding answer key is included in Appendix A.

B. The Achievement Test

An achievement test consisting of twenty-five questions based on the content of the CAI program was prepared and administered by the writer in class five days after all students in the sample group had completed the CAI program. Two overhead transparencies of the

following infra-red composite false color images were used with the achievement test:

Calgary March 3rd, 1977 Path 45 Row 24

Calgary August 5th, 1975 Path 45 Row 24

A sample of the achievement test and corresponding answer key is included in Appendix B.

C. Landsat CAI Program Attitude Questionnaire

The attitude questionnaire used in this study consisted of fourteen items designed to measure student attitudes toward the Landsat image interpretation program with CAI as a mode of instruction. Students were required to respond to each item in terms of seven categories of agreement or disagreement. This type of questionnaire is often referred to as a "Likert-type scale" (Selltiz et al., 1965, p. 366). Numerical values assigned to items ranged from one point for strongly disagree to seven points for strongly agree.

1) Limitations of Attitude Scales

The writer examined attitude scales developed by Likert, Thurstone and Gutman and selected the Likert-type scale as being the most appropriate for this study. However, Borg and Gall (1979: 110) caution that the majority of attitude scales are direct self-report measures and are subject to the following limitations:

a) We can never be sure of the degree to which the subject's response reflect his true attitudes.

b) An individual may not really know how he feels about an issue or situation.

c) He may never have given the idea serious consideration, and

d) An individual may conceal his real attitude, and express socially acceptable opinions.

In consideration of the above limitations, any results arising out of the use of the Likert-type attitude scale should be interpreted with caution. A sample of the Landsat CAI program attitude questionnaire is included in Appendix C.

D. The Written Comment Sheet

In order to obtain another measure of student opinions about Landsat satellite image interpretation and CAI as a mode of instruction, a written comment sheet allowing for response to four open-ended questions was administered at the same time as the Likert-type attitude questionnaire. A sample of the written comment sheet is included in Appendix D.

CHAPTER IV

Results and Discussion

Results of the Investigation

1. The Survey Questionnaire

Members of the experimental group were asked to respond to a thirteen item questionnaire administered one week before participating in the Landsat CAI program. The mean score for the survey questionnaire was 1.636, the standard deviation, 1.524.

Responses to the three questions on the survey questionnaire pertaining to the student's prior knowledge of Landsat images before taking the Landsat CAI program indicated that only five students had ever worked with Landsat images before, and only two students in the sample had taken courses dealing with Landsat image interpretation. All members of the sample group felt they had little if any knowledge of Landsat image interpretation.

2. The Landsat CAI Program

The Omega program recorded the following measures on each student.

i) percentage of students covering all sections of the program,

ii) percentage of questions answered correctly on first attempt,

iii) number of time branching feature used, and

iv) amount of time to complete the program.

i) Percentage of Students Covering All Sections of the Program

All members of the experimental group covered the complete program in one or two sessions at the computer terminal within a five day period.

ii) Percentage of Questions Answered Correctly on First Attempt

Approximately 66% of the 26 questions concerning the course material were answered correctly on the first attempt by all students taking the program.

iii) Number of Time Branching Feature Used

The results indicated that this group of students made little use of the branching feature to review; only two percent of all possible branching options were executed by the experimental group.

iv) Amount of Time to Complete the Program

The mean time for all students to complete the program was 121 minutes; the standard deviation was 0.023. All results pertaining to section two of this chapter are summarized in Table 1.

3. The Achievement Test

An achievement test consisting of twenty-five questions based on the content of the Landsat CAI program was administered to the experimental group one week after all students had completed the CAI program. The mean score on the achievement test was 17, the standard deviation was 3.811. Percentages of students correctly answering each question and the results of the achievement test are shown in Table II.

4. Landsat CAI Attitude Questionnaire

The attitude questionnaire used in this study consisted of fourteen items designed to measure student attitudes toward the Landsat CAI program. Students were required to respond to each item in terms of seven categories of agreement or disagreement. Numerical values assigned to individual items ranged from one point for checking

TABLE I

STUDENT PERFORMANCE MEASURES RECORDED
BY THE CAI LANDSAT PROGRAM OMEGA

		Mean and/or %
i)	Percentage of Students Covering all Sections of Program	$\bar{X}$ = 100%
ii)	Percentage of Questions Answered Correctly on First Attempt 26 questions	$\bar{X}$ = 66%
iii)	Number of Times Branching Feature Used	
	- Segment 1	(9)*
	- Quiz 1	(1)
	- Segment 3	(2)
	- Quiz 4	(2)
	- Quiz 5	(2)
	- Quiz 6	(5)
	- Segment 9	(4)
	- Segments 4 - 9 incl.	(6)
	- Complete Review	(6)
	The total number of students using the branching option was 17.	
iv)	Mean Time to Complete the Program	$\bar{X}$ = 121 minutes S.D. - 0.23

* denotes number of students exercising branching option

TABLE II

ACHIEVEMENT TEST QUESTION ANALYSIS

Question	% Correct	% Partially Correct	% Incorrect
1	68.15 (15)*	---	31.82 (7)
2a	81.82 (18)	---	18.18 (4)
b	81.82 (18)	---	18.18 (4)
3	63.64 (14)	---	36.36 (8)
4	81.82 (18)	---	18.18 (4)
5	95.45 (21)	---	4.55 (1)
6	77.27 (17)	---	22.73 (5)
7	50. (11)	---	50. (11)
8	59.09 (13)	---	40.91 (9)
9	72.73 (16)	---	27.27 (6)
10	63.64 (14)	---	36.36 (8)
11	77.27 (17)	---	22.73 (5)
12	40.91 (9)	9.09 (2)	50. (11)
13	86.36 (19)	---	13.64 (3)
14	72.73 (16)	---	27.27 (6)
15	59.09 (13)	---	40.91 (9)
16	63.64 (14)	---	36.36 (3)
17	68.18 (15)	---	31.82 (7)
18	72.73 (16)	---	27.27 (6)
19	40.91 (9)	36.36 (8)	22.73 (5)
20	50. (11)	22.73 (5)	27.27 (6)
21	50. (11)	9.09 (2)	40.91 (9)
22	86.36 (19)	---	13.64 (3)
23	72.73 (16)	9.09 (2)	18.18 (4)
24	36.36 (8)	4.55 (1)	59.09 (13)
25	36.36 (8)	---	63.64 (14)

* Brackets denote number of students

N = 22 Range = 11-23

$\bar{X}$ = 17

strongly disagree to seven points for strongly agree.

The results of the student attitude questionnaire clearly indicated that the students viewed the program favourably. On the average, over 80% of the students rated each of the evaluation items as a four or better on the Likert scale ranging from one - strongly disagree to seven - strongly agree with the statements presented.

The majority of students felt the course was useful in helping them to learn the material; that taking the course was a good investment of their time, and would recommend the Landsat CAI course to other students. Few students had been taught any portions of the material previously. While the majority of students felt the course was reasonably easy to understand and had a good basic knowledge concerning Landsat satellite images, the same students expressed the need for more instruction to improve their ability to interpret satellite images. The items which received the highest rating concerned the students attitudes toward CAI: the majority liked taking the Landsat course via computer-assisted instruction; found the course interesting, and expressed a desire to take other courses via CAI. The results clearly indicated that the majority of students preferred CAI as a mode of instruction over the traditional lecture method and would themselves, as future social studies teachers, teach Landsat image interpretation with the aid of CAI. The results of the student attitudinal questionnaire are summarized in Table III.

Scores on the attudinal questionnaire were then compared with scores on the achievement test. There was no statistical correlation between scores on the Likert type attitudinal questionnaire and scores on the achievement test at the .01 and .05 Alpha levels.

TABLE III

MEANS AND STANDARD DEVIATIONS OF LIKERT TYPE ATTITUDINAL QUESTIONS AND CORRELATIONS AND PROBABILITY LEVELS BETWEEN ACHIEVEMENT TEST AND LIKERT TYPE ATTITUDINAL QUESTIONS

Likert Question	Mean	Standard Deviation	Correlations with Posttest (r)	Probability Levels (p)
1	4.500	1.530	0.347	0.114
2	5.182	1.336	-0.009	0.969
3	4.773	1.241	0.394	0.069
4	1.500	1.118	-0.005	0.981
5	6.455	0.782	-0.099	0.661
6	5.818	1.029	0.104	0.644
7	5.773	1.346	-0.230	0.302
8	3.545	1.827	-0.222	0.321
9	5.136	1.179	0.192	0.392
10	5.091	1.276	0.341	0.120
11	3.818	0.886	-0.269	0.226
12	4.273	1.052	0.187	0.405
13	5.182	1.556	0.234	0.295
14	5.273	1.601	0.324	0.141

N=22
DF=20

5. Student Written Comments Sheet

All members of the sample group were provided with the opportunity to express in writing their comments as to their experience with the Landsat CAI program. The students were asked to respond to the following four questions:

1. What is your opinion of the Landsat CAI program?

2. What problems, if any, did you experience while taking the program?

3. How might the CAI program be improved?

4. Would you as a future teacher of social studies teach Landsat satellite image interpretation by the traditional lecture method or by computer-assisted instruction? Give reasons for your answer.

Question One What is your opinion of the CAI Landsat program?

The findings indicated that 20 students responded positively to the CAI program; one student was neutral in his response and one student was negative in his attitude toward the CAI program.

Question Two What problems, if any, did you experience while taking the program?

Fourteen students indicated they experienced some problems while taking the program; three students did not experience any problem and five students did not respond to the question.

Question Three How might the CAI program be improved?

Fourteen students responded to this question.

Question Four Would you as a future teacher of social studies teach Landsat satellite image interpretation by the traditional lecture method or by computer-assisted instruction? Give reasons for your answer.

Fourteen students indicated they would teach Landsat image interpretation by computer-assisted instruction. Four students indicated

they would use both CAI and the lecture method and four students indicated they would teach Landsat image interpretation using the traditional lecture mode of instruction. Responses to these four questions are summarized in Table IV.

Discussion of Results

1. The Survey Questionnaire

The mean score of 1.636 and standard deviation of 1.524 suggests that all students in the sample had little, if any, prior knowledge of Landsat image interpretation. Further, the survey questionnaire scores of the five students who indicated they had either worked with or had taken courses dealing with Landsat image interpretation, were not significantly different from those students who had no prior exposure to the subject. Further, the achievement test scores of these five students were not significantly different from the scores of those students who had no prior exposure to Landsat satellite images. It would appear from the foregoing, that what little prior knowledge these students claimed to have, did not effect their performance.

It should be noted that all students in the experimental group expressed the view that at the time the survey questionnaire was administered, their knowledge of Landsat satellite images was very meager.

2. The Landsat CAI Program

The average student time to complete the CAI program was 121 minutes, the standard deviation 0.23, the range 39 minutes to 212

TABLE IV

STUDENT RESPONSES TO FOUR QUESTIONS ON COMMENT SHEET

QUESTION 1	QUESTION 2	QUESTION 3	QUESTION 4	
Has promise	Wanted to ask questions	Ask more questions	Both	- CAI is confusing by itself
Good	Did not know what was important	Improve on problems	CAI	- Would do follow-up in traditional way
Very good	Too many facts	More explanation	CAI	- More enjoyable, exciting
Excellent	Its a chore to take notes	Give a brief summary	Both	- Can compare techniques
Enjoyable, great addition	Difficulty interpreting images, can't see anything	Ok as is	Both	- Advantages to both
Fine	Cannot type fast	OK	CAI	- Good to vary one's technique
O K	Nervous	Broader answers	Traditional	- Not possible to use CAI in schools
Very Challenging	No background	More questions	Traditional	- More studies need to be done in CAI
Good source of information	No problems	More questions	CAI	- Allows us to work at our own speed
Very good	No problems	More time to study images	CAI	- Holds children's attention
Interesting	Takes too long		CAI	- No explanation provided
Good	Sore eyes		CAI	- More Interesting
Interesting	Need a glossary of terms		Both	- Teacher can provide added dimensions
Very interesting	Define terms		CAI	- Nobody talking at you, its lots of fun
All right	More review		CAI	- Immediate feedback
Useful technique	Provide definitions		Both	- Cannot ask questions
Boring			Traditional	- Need a voice
Novel			CAI	- No explanation provided
Very Interesting			CAI	- No explanation provided
N=22 20 responses	16 responses	11 responses	19 responses	

minutes. Only one student completed the program in 39 minutes and one student in 212 minutes. The mean time of 121 minutes is more representative of the majority of students. The range of time demonstrates the capacity of CAI to allow for different paces of learning by the students.

The collection of data on each student's performance is an important characteristic of CAI. Such information is available for use by the instructor, for student feedback, and for research purposes. For the purposes of this study, the performance recordings permitted examination of differences between students who took the program. In addition, the use of performance records enabled the author to detect technical programming errors and were an invaluable aid in determining which parts of the program were poorly designed, particularly in regard to certain question items, and in deciding what improvements could be made to the program. For example, the parameters for acceptable answers to selected questions were, on several occasions, expanded as a result of student feedback during trial runs. In response to the question "What do the small while rectangles alongside the Winnipeg River indicate?" the range of acceptable answers included forest clearing, wood cutting, forest cutting, and timber cutting. Three students typed in lumbering which is an equally acceptable answer.

15 students (68%) of the sample, answered the 26 questions which dealt with the course material correctly on the first attempt. Undoubtedly, this proportion would have been higher but for some technical errors which resulted in lower scores for some students than would have been the case.

An analysis of the performance recordings revealed that some of the questions were poorly presented or that the student did not fully comprehend the automatic introductory instructions on how to use the key board and light pen at the computer terminal. For example, some of the questions were designed to accept a light pen response. On several occasions, three response alternatives to a given question were placed on the screen under which was the instruction 'Point to a, b or c.' Several students pointed to either a, b or c in this instruction, rather than one of the choices above it. Because the program was designed to accept a light pen response only where the choices were located, these student's responses were recorded as incorrect or unrecognizable for their first attempt. Had some of the question items been presented more clearly, then the proportion of students responding correctly to those questions would have been higher.

The type of feedback message given to students after their initial response would also seem to influence the accuracy of subsequent responses. It is difficult to maintain the delicate balance between providing too little or too much information in constructing feedback messages. More research on the effect of feedback messages on student response is needed.

In general, the results indicated that a large portion of the questions concerning the course material were answered correctly on the first attempt. Inability to type, or use the keyboard and light pen properly also appears to have contributed to the lowering of scores. The achievement test scores of those students who experienced problems operating the terminals were about ten percent lower than

those students who did not experience any difficulty. Specific student suggestions on how the Landsat CAI program might be improved will be dealt with later in this chapter.

The results indicated that the program's branching feature was little used by the students. Out of the nine possible branching features available in the program, less than two percent of the sample exercised this feature of the program. While less than two percent of all possible branching options were executed by the sample, the fact that some students used this feature more than once suggests that it should be kept as part of the program for those students who would like to make use of this feature. Because of the heavy schedule of CAI courses currently offered by the Division of Educational Research Services, the amount of time available to the student to complete the program may have influenced his or her decision to execute the branching feature. In response to suggestions made by a number of students in the experimental group, the branching function within the CAI program was re-examined and modifications were made where deemed necessary.

3. The Achievement Test

Results of the achievement test indicate that the objectives of this feasibility study was achieved. Pre-service teachers can understand and derive information from Landsat satellitle maps with the aid of computer-assisted instruction. The mean score of 17 on the achievement test attests in some measure to the effectiveness of the Landsat CAI program.

Generally speaking, the majority of questions on the achievement

test were answered well. However, students experienced minor problems in three areas: characteristics of wave length bands, straight factual information and interpretation.

Questions 15, 16 and 17 dealing with characteristics of wave length bands caused the students some problems. The characteristics of each wave length for bands, 4, 5, 6, and 7 were explained at length in the CAI program and the students were examined on this concept shortly after it was presented. The response analysis for these questions on the posttest would suggest that while students were aware of the individual characteristics of each wave length band, they got them confused. The time lapse between completion of the CAI program and the writing of the posttest may have had some influence on the ability of students to recall the associated characteristics with a particular band number. Modifications were made to the program to highlight the individual band wave length characteristics after all students completed the program and wrote the achievement test.

Questions 19, 20, 21 and 24 also caused the students some minor problems. These questions asked the student to recall straight factual information dealing with various services offered by remote sensing agencies. Analysis of student responses suggest that many of the students knew the services provided by the agencies, but confused them with one another. Modifications were made to the program to highlight for review purposes, the services offered by the remote sensing agencies.

One of the suggestions put forth by the students was to include a glossary of terms in the Landsat CAI program. This suggestion I

believe, is a good one and should serve to help individual students to better comprehend concepts covered later in the program. The program was modified to include a glossary of terms.

Some students experienced minor difficulty with questions 1, 3, 7 and 12 dealing with the interpretation of satellite images. Analysis of the responses to the above-mentioned questions suggest that while the majority of students were aware that water is generally shown as black on a composite false color image, it can also appear in various shades of blue depending on the amount of sedimentation in the water. The section of the program dealing with sedimentation was re-examined and changes were made accordingly.

Few students (8) remembered the scale of Landsat satellite images in response to question 25. Further, several students experienced perceptual problems in interpreting satellite images. Not all students comprehended the fact that Landsat satellite photographs of the earth's surface are taken from a distance of approximately 929 km above the earth, and thus experienced some perceptual problems in attempting to interpret the images.

4. The Landsat CAI Attitude Questionnaire

Earlier in this thesis I alluded to some of the limitations that are associated with the use of attitude questionnaires, suggesting that any results that are reported, should be interpreted with caution and supported, where possible, by other measures. The writer used a written comment sheet which allowed for responses to four open-ended questions as an additional measure to cross-check information obtained from the "Likert-type" attitude questionnaire. Following are some generalizations that can be drawn from the results obtained from the attitude questionnaire.

The results of the study clearly indicate that the majority of students in the experimental group with their limited background and prior knowledge of Landsat satellite imagery, viewed the 'Omega' CAI program favourably, found it to be effective, and a useful and worthwhile experience. These same students found the course sifficiently interesting and stimulating to want to obtain further instruction in satellite imagery interpretation. This fact would tend to support current research findings which suggest that teachers who are exposed to CAI in conjunction with classroom instruction, are usually desirable of more indepth instruction in the same subject matter (Hunka, 1976, p. 18).

Certainly the students in the experimental group recognized the difficulty, and at the time of this writing, the impossibility, of having a CAI system installed in every school. However, given the opportunity, as future teachers of social studies, they would make definite use of this technology. The important thing here is that exposure to both computer-assisted instruction and satellite imagery interpretation has enlarged the student's repetoire of resources.

Previously in this chapter, I stated that the scores on the Likert attitude questionnaire were correlated with scores on the achievement test at the .01 and .05 Alpha levels. The results suggest that we cannot predict with any degree of accuracy that a student who responded positively toward CAI on any of the 14 variables, will also perform well on an achievement test. Stated another way, there is no statistical significant correlation between scores on the attitude questionnaire and scores on the achievement test.

5. Student Written Comment Sheet

Being aware of the possibility of various shades of nuances which might be attached to various expressions used in the student's responses, the author cross-checked their choice of words with their attitudes expressed on the Likert questionnaire to make sure that what the students expressed in writing was congruent with their attitudes previously expressed. It may be stated that the written responses of the students show a high degree of congruency with their previously expressed attitudes on the Likert attitudinal questionnaire.

Responses to question 1 confirm current research findings that students who are exposed to CAI for the first time are highly favourable toward this mode of instruction. Further, the novelty of the Landsat CAI program would appear to have the staying power that is common to most CAI programs which generally lasts throughout the course (Hunka, 1976, p. 17).

Student responses to question 2 were comparable to the responses of the several hundred students who have participated in the introductory statistics course "stats-1" via CAI. These responses ranged from: "I wanted to ask questions, I was nervous, had no background, to I cannot type and had sore eyes." It should be noted that many of the problems experienced by the students are related to factors of emotion and discomfort rather than being a reflection on the Landsat CAI program.

It seems clear from the general comments, that the students were fairly apprehensive about being exposed to two forms of modern technology at the same time. While the majority of students enjoyed the program, there was an initial period of uncertainty or uneasiness that prevailed during the early stages of the course. However, this seemed to dissipate as the students became more actively involved

with the computer. Dr. Hunka, coordinator of the Division of Educational Research Services expressed the view that the anxiety level of many students generally rises when beginning other CAI courses offered by DERS and usually subsides as students progress through the program.

It was mentioned at the outset of this thesis that CAI is an alternative to, not a replacement for the traditional lecture mode of instruction. The majority of students taking the Landsat CAI program felt strongly , the need for an instructor or competent person to be available in the terminal room to respond to questions. The writer made himself available in the terminal room throughout all student sessions. Of the few questions that were asked while students were in the terminal room, the majority related to the functioning of the terminal as opposed to the content of the CAI program. During the student sessions at the terminal, several students complained of sore eyes resulting from glare or reflection off the cathode ray tube and satellite images. Investigation of these and other problems relating to perception would seem to be called for.

Student responses to question 3 were very helpful although less than half the sample responded. Their specific suggestions can be cagegorized into the following areas: more questions, more inter-action, a glossary of terms, and different explanations when reviewing material.

An analysis of the student performance recordings and instructional strategies in the program would seem to call for the inclusion of more questions in the program. More interaction is needed as each topic is covered to maintain student interest and comprehension of the course material. Further research is recommended in this area.

Several students suggested that the number of branching options be increased and that less material be covered before a review option is made available. Because little use was made of the branching option, more research is required to determine if this aspect of the program is useful and effective.

These results permitted the writer to re-examine the Landsat CAI program and to make some modifications to the program to better serve and enhance the learning experience of subsequesnt groups of students. The importance of incorporating user suggestions into the program cannot be underestimated. However, additional research is necessary to evaluate the effect of these modifications with a larger sample. It can, and has been argued amongst interested CAI authors that the design of a CAI program is never complete (Hunka & Romaniuk, 1979). There is always something one can do to improve the program as a result of student feedback and the analysis of performance records. This study is not exempt from that statement.

Student responses to question 4 did not bring any surprises. As expected, the majority of students indicated a preferance for CAI as a mode of instruction, while others preferred both the CAI and traditional lecture method. Until CAI can be installed in the schools on a large scale basis with ongoing research and evaluation, it is understandable why some students in the sample preferred the traditional lecture mode of instruction. Still there were some skeptics in the sample and justifiably so; CAI as a mode of instruction is only one of many interesting and stimulating forms of instruction. It is worth noting however, that teacher inertia (which may have various causes) is one of the outstanding deterrents to the use of the newer media (Gillett, 1973, p. 83).

In summary, the results of the achievement test showed that students can understand and derive information from Landsat satellite images with the aid of computer-assisted instruction. The results of the student attitude questionnaire revealed that the student's felt the course material was interesting and well presented, that they benefited from taking the course, and that they would not hesitate to recommend the 'Omega' CAI program to others. In addition, the majority of students indicated they would teach Landsat satellite image interpretation with CAI or both the CAI and traditional lecture methods. Specific student suggestions to improve the CAI program gleaned from their written comments, have been incorporated into the Landsat CAI program.

CHAPTER V

Conclusions and Recommendations

The results of the study showed that a computer-assisted instruction program can be developed to teach Landsat satellite image interpretation. Secondly, the results clearly demonstrated that students can understand and derive information from Landsat satellite images with the aid of CAI.

The findings also revealed that the majority of students in the sample expressed a highly favourable attitude towards the 'Omega' CAI program. Consequently, another conclusion reached from this study was that the Landsat CAI program could be a beneficial addition to a social studies teacher education program.

The study also demonstrated that CAI can be used to present the Landsat course material in a detailed and well organized manner, which suggests that other programs could be developed that have particular significance for social studies. In addition, the study has shown that the quality of a CAI program can be continually upgraded through the acquisition of information obtained from the students' performance recordings. In this regard, the precise monitoring of each student's performance during the course cannot be equalled by the traditional lecture and examination approach.

Recommendations for further research

From the results of this exploratory study, it is recommended that more research on CAI in the social studies be conducted. Following are some suggested research problems for further investigation:

1. Will multistudent performance at a single terminal result in higher achievement scores than a single student at a single terminal?

2. Can students understand and derive information from black and white Landsat satellite images with the aid of CAI?

3. Is there one optimum CAI instructional strategy for working with Landsat satellite images?

4. To what extent do student perceptual problems effect their learning of CAI course material?

5. Is learner control (the freedom to move about in a program) a desirable feature of a CAI program?

6. In what other content areas in the social studies can CAI be applied?

In summary, the two objectives of this study have been achieved. A Landsat satellite computer-assisted instruction program was developed to teach satellite imagery interpretation, and students were able to understand and derive information from Landsat satellite images with the aid of CAI.

Afterthoughts

The Landsat satellite program 'Omega' is now part of the operational CAI system in the Division of Educational Research Services. A second group of social studies Ed. C & I 413 students have completed the Omega program. A general survey of the attitudes of this second group of students toward the Landsat CAI program support and confirm the results of the earlier exploratory study.

FOOTNOTES

[1]Hunka, Steve S. Catalogue of CAI Courses. Edmonton: Division of Educational Research Services, University of Alberta, 1978, p. 29.

[2]An ERIC computor search (CIJE and RIE) was made using the following search code: Teacher Education, Map Skills, Location Skills, Social Studies. In addition a search was made using the RESORS system (Canada Centre for Remote Sensing Computor Based On-Line Document Retrieval System), the Canadian Education Index and Education Index.

[3]Howarth, Phillips J. "Remote sensing/photogrammetry education in the United States and Canada". Hanover, P.A.: Photogrammetric Engineering and Remote Sensing. Vol. 43, No. 3, March 1977, pp. 259-284.

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APPENDICES

APPENDIX A

THE SURVEY QUESTIONNAIRE WITH ANSWER KEY

THE UNIVERSITY OF ALBERTA

Department of Elementary Education

SURVEY QUESTIONNAIRE

Name _____

INSTRUCTIONS

Please fill in the answers to the questions in the space provided.

1. What is it that you are looking at (be specific).

_____

_____

2. How do you think this was created?

_____

_____

3. Have you ever worked with this before? Yes ____ No ____. If yes, how?

_____

_____

4. What features do you see under Grid number 1 .

_____

_____

_____

_____

5. What features do you see under Grid number 12 .

_____

_____

_____

_____

6. What features do you see under Grid number 6 .

7. What does the color red on this projection indicate?

8. What do the small rectangles shown on this projection indicate?

9. Under Grid 8 , what does the black indicate?

10. Under Grid 15 , what does the blue indicate?

11. What do you think the normal scale of this projection is?

12. Have you ever taken any courses that dealt with what you are looking at? No _____ Yes _____. If yes, give place and course number.

13. My knowledge of projections of this nature is:

Very meager — Very extensive

1 2 3 4 5 6 7

Survey Questionnaire Answer Key

Question	
1	Landsat satellite map (image
2	Satellite photograph
3	n/a *
4	River
5	City
6	roads
7	vegetation
8	Farms or farmland
9	Water or lake
10	water or lake with sedimentation
11	1:1 million
12	n/a
13	n/a

* denotes - not applicable

APPENDIX B

THE ACHIEVEMENT TEST WITH ANSWER KEY

THE UNIVERSITY OF ALBERTA

Department of Elementary Education

Landsat C.A.I. Program

ACHIEVEMENT TEST

NAME _____

Instructions

Please fill in the answers to the questions in the space provided and/or circle the letter which best indicates your choice of answer.

*NOTE - There will be two transparancy projections used during the post-test.

1. What feature is <u>most</u> conspicuous within Grid number 4?

_____

2. Two areas on this image are white in color.

   (a) Name the Grid number within which there is evidence of cloud cover.

   _____

   (b) Name the Grid number within which there is evidence of snow.

   _____

3. What does the blue color within Grid number 5 indicate?

_____

4. What does the color red on this projection indicate?

_____

_____

5. Name three Grid numbers within which there is evidence of water.

_____

6. Name a Grid number within which a city is located.

_____

7. Name a Grid within which you find evidence of sedimentation.

_____

8. What feature on this projection is indicated by the small rectangles?

_____

9. The blue lines shown on this projection represent:

   a) rivers
   b) valleys
   c) highways
   d) lakes

10. The tiny criss-crossing lines shown on this image within Grid number 7 represent:

    a) city streets
    b) roads
    c) fences
    d) rivers

*NOTE: A new transparency will be inserted at this point.

11. This image would have most likely been created in:

    a) mid-summer
    b) early fall
    c) mid-winter
    d) late spring

12. Explain why the area within Grids 7 and 8 is not covered by snow.

_____

_____

_____

13. Name a Grid number within which there is evidence of mountains.

_____

14. Name a Grid number within which there is evidence of open water.

_____

15. Band 4 is useful for which of the following characteristics:

    a) detecting cultural features
    b) vegetation classifications
    c) detecting turbidity in water
    d) geological classifications
    e) all of the above
    f) none of the above

16. Band 7 is useful for all of the following characteristics except:

    a) detection of water
    b) detecting conifer and deciduous forest areas
    c) reflectance of wet soils
    d) detecting the extent of blight and insect infestations

17. Band 6 is most useful for its water characteristics (Answer true or false)

    True _____ False _____

18. In the visible spectrum, Band 5 lies between .600 and .700 millimicrons in wave length and is most useful for discriminating vegetation types. (Answer true or false).

    True _____ False _____

19. Canada has two Landsat receiving stations. Name their locations.

    _____

20. Define Remote Sensing.

    _____

    _____

    _____

    _____

21. What kind of service does the EROS Data Center provide?

    _____

    _____

22. The images that you worked with at the C.A.I. terminal and the image that is currently projected are known as:

    _____

23. The wave length band numbers included in the make up of these images (see question 22) are:

    Bands _____

24. What service does Integrated Satellite Information Service (ISIS) provide?

    _____

25. What is the normal scale of a Landsat satellite image?

_____

Achievement Test Answer Key

Question

1 Lake

2a 12

2b 9

3 Water or lake

4 Vegetation

5 3,5,7,10,12

6 11, 7

7 10

8 farms or farmland

9 rivers

10 roads

11 mid-winter

12 chinook or warm southern wind from the Rockies

13 9, 14

14 9

15 All of the above

16 Detecting conifer and deciduous forest areas

17 False

18 True

19 Prince Albert Sask. and Shoe Cove Nfld.

20. The art of acquiring information about material objects from measurements made at a distance without actually touching the object.

21 World wide images and technical information

22 Infra-red composite false color images (satellite images)

23 4,5,6,7

24 Distributes a daily set of satellite microfiche to clients

25 1:1 million

APPENDIX C

LANDSAT CAI PROGRAM ATTITUDE QUESTIONNAIRE

LANDSAT CAI PROGRAM ATTITUDINAL QUESTIONNAIRE

1. I found the course was useful in helping me learn the material.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

2. The material in this course was:

Very Boring						Very Interesting
1	2	3	4	5	6	7

3. This material was easy to understand.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

4. What portion of this material had you been taught previously?

None						All
1	2	3	4	5	6	7

5. Someone who is knowledgeable of the course content should be available in the terminal room.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

6. When the course lecturer or assistant was in the terminal room, I felt that person did a good job in answering my questions.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

7. I still feel I need more instruction to interpret satellite images.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

8. It would have been easier to learn this material by classroom instruction.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

9. Taking this course was a good investment of my time.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

10. I would recommend this course to other students or educational personnel.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

11. I would rate the difficulty level of this course as being:

Very Easy						Very Difficult
1	2	3	4	5	6	7

12. I feel I have a good basic knowledge concerning landsat satellite images.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

13. I liked taking this course via Computer-Assisted Instruction.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

14. I would like to take other courses via Computer-Assisted Instruction.

Strongly Disagree						Strongly Agree
1	2	3	4	5	6	7

APPENDIX D

LANDSAT CAI PROGRAM WRITTEN COMMENT SHEET

COMMENT SHEET

1. What is your opinion of the CAI Landsat program?

2. What problems, if any, did you experience while taking the program?

3. How might the CAI program be improved?

4. Would you as a future teacher of social studies teach Landsat satellite image interpretation by the traditional lecture method or by computer-assisted instruction?

By traditional method _____ By C.A.I. _____

Give reasons for your answer.

APPENDIX E

LANDSAT SATELLITE CAI PROGRAM 'OMEGA'

```
OMEGA
__    1 BR  INTRO\
__    2 LD  0¬/S1\
INTRO
__    1 LD  1¬/S0\
__    2 LD  1¬/S1\
__    3 FN2 UA2¬/0\
UA2END
__    1 PRR \
__    2 DE  0¬/32\
__    3 NO  COPY¬/DRWMCK-2¬,DRWMCK-35¬,SDRAW-4\
__    4 CM  DRWMCK¬/0¬,0\
__   38 NO  EM\
__   39 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   40 DE  0¬/32\
__   41 DE  0¬/32\
__   42 DTI 2,17¬/2,2¬/40,0¬/<OMEGA%%%%%>_____\
__   43 DT  6,2¬/2,6¬/40,0¬/<A COMPUTER>-<ASSISTED INSTRUCTION COURSE%%%%
             %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%>_____________________________
             __\
__   44 DTI 10,18¬/2,10¬/40,0¬/<ON%%>__ \
__   45 DT  15,11¬/2,15¬/40,0¬/<LANDSAT SATELLITE%%%%%%%%%%%%%%%%%>_____
             _____________\
__   46 DTI 20,8¬/2,20¬/40,0¬/<IMAGERY INTERPRETATION%%%%%%%%%%%%%%%%%%
             %%>_____________________\
__   47 DT  25,8¬/2,25¬/40,0¬/<AUTHOR LEE G>. <ARMSTRONG%%%%%%%%%%%%%%%%
             %%%%%%>_____________________\
__   48 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG1
__    1 NO  EM\
__    2 PRR \
__    3 DE  0¬/32\
__    4 DT  6,0¬/2,6¬/40,0¬/<MAN MUST RISE ABOVE THE EARTH TO THE >\
__    5 DTI 10,0¬/2,10¬/40,0¬/<TOP OF THE ATMOSPHERE AND BEYOND >- \
__    6 DTI 14,0¬/2,14¬/40,0¬/<FOR ONLY THUS WILL HE FULLY UNDERSTAND >\
__    7 DTI 18,0¬/2,18¬/40,0¬/<THE WORLD IN WHICH HE LIVES>.  \
__    8 DTI 21,12¬/2,21¬/40,0¬/(<S>OCRATES - 500 <B C >)\
__    9 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   10 DTI 6,0¬/32,6¬/40,0¬/\
__   11 DTI 6,0¬/2,6¬/40,0¬/<M>AN HAS INDEED PROVEN THAT <S>OCRATES \
__   12 DT  9,0¬/2,9¬/40,0¬/WAS RIGHT.  <T>ODAY THERE ARE
              INDEED RIGHT.  <T>ODAY THERE ARE\
__   13 DT  12,0¬/2,12¬/40,0¬/VIRTUALLY THOUSANDS OF SATELLITES IN \
__   14 DT  15,0¬/2,15¬/40,0¬/ORBIT CIRCLING THE GLOBE TAKING
             LEING THE GLOBE TAKING \
__   15 DT  18,0¬/2,18¬/40,0¬/PICTURES OF THE EARTH'S SURFACE.        OF
             THE EARTH'S SURFACE.  <T>HE\
__   16 DT  21,0¬/2,21¬/40,0¬/<I>NFORMATION OBTAINED FROM THESE \
__   17 DT  24,0¬/2,24¬/40,0¬/SATELLITES IS BEING USED TO MANAGE    \
__   18 DT  27,0¬/2,27¬/40,0¬/THE ENVIRONMENT.\
__   19 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
```

```
SEG1
__  20 DE  0¬/32\
__  21 DTI 6,0¬/2,6¬/40,0¬/<T>HE COURSE YOU ARE ABOUT TO UNDERTAKE,\
__  22 DTI 9,0¬/2,9¬/40,0¬/WILL INTRODUCE YOU TO THE WORLD OF \
__  23 DTI 12,0¬/2,12¬/40,0¬/REMOTE SENSING AND WILL TEACH YOU THE \
__  24 DTI 15,0¬/2,15¬/40,0¬/BASIC SKILLS OF LAND SATELLITE IMAGERY \
__  25 DTI 18,0¬/2,18¬/40,0¬/INTERPRETATION.  \
__  26 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  27 DE  0¬/32\
__  28 DT  0,0¬/2,0¬/40,0¬/<T>HE NEXT SCREEN DISPLAY WILL PRESENT \
__  29 DT  3,0¬/2,3¬/40,0¬/THE <T>ABLE OF <C>ONTENTS.  <T>HE <T>ABLE OF\
__  30 DT  6,0¬/2,6¬/40,0¬/<C>ONTENTS SERVES TWO MAIN PURPOSES.  \
__  31 DTI 11,0¬/2,11¬/40,0¬/1.  <I>T WILL GIVE YOU A QUICK REFERENCE \
__  32 DTI 13,4¬/2,13¬/40,0¬/AS TO WHAT MATERIAL IS TO BE COVERED\
__  33 DTI 15,4¬/2,15¬/40,0¬/IN THE PROGRAM,AND\
__  34 DTI 20,0¬/2,20¬/40,0¬/2.  <I>T CAN BE USED A A REFERENCE POINT \
__  35 DTI 22,4¬/2,22¬/40,0¬/TO BRANCH TO ANY OF THE SEGMENTS IN THE \
__  36 DTI 24,4¬/2,24¬/40,0¬/PROGRAM SHOULD YOU DESIRE A REVIEW.  \
__  37 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  38 DE  0¬/32\
__  39 DT  0,11¬/2,0¬/40,0¬/<TABLE OF CONTENTS >\
__  40 DL  3,11¬/17\
__  41 DT  6,0¬/2,6¬/40,0¬/<S>EG-1  <I>NTRODUCTION TO REMOTE SENSING \
__  42 DT  9,0¬/2,9¬/40,0¬/<S>EG-2  <L>ANDSAT SATELLITES \
__  43 DT  12,0¬/2,12¬/40,0¬/<S>EG-3  <C>HARACTERISTICS OF WAVE BANDS \
__  44 DT  15,0¬/2,15¬/40,0¬/<S>EG-4  <I>NTERPRETATIONS TECHNIQUES \
__  45 DT  18,0¬/2,18¬/40,0¬/<S>EG-5  <L>ANDSAT IMAGERY INTERPRETATION \
__  46 DT  21,0¬/2,21¬/40,0¬/<S>EG-6  <S>UMMER IMAGE INTERPRETATION\
__  47 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  48 DE  0¬/32\
__  49 DT  0,11¬/2,0¬/40,0¬/<TABLE OF CONTENTS >\
__  50 DL  3,11¬/17\
__  51 DT  8,0¬/2,8¬/40,0¬/<S>EG-7  <W>INTER IMAGE INTERPRETATION\
__  52 DT  11,0¬/2,11¬/40,0¬/<S>EG-8  <I>MAGE ANALYSIS EQUIPMENT \
__  53 DT  14,0¬/2,14¬/40,0¬/<S>EG-9  <R>EMOTE SENSING AGENCIES \
__  54 DT  17,0¬/2,17¬/40,0¬/<S>EG-10 <F>INAL REVIEW OPTIONS \
__  55 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  56 DE  0¬/32\
__  57 FN  XP¬/4¬/16¬/4¬/<REMEMBER>\
__  58 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  59 DE  0¬/32\
__  60 DT  4,0¬/2,4¬/40,0¬/<Y>OU WILL BE GIVEN THE OPPORTUNITY TO \
__  61 DT  7,0¬/2,7¬/40,0¬/REVIEW%%%%%%_____ MANY OF THE SECTIONS OF TH
          E \
__  62 DT  10,0¬/2,10¬/40,0¬/COURSE.  <T>HE COMPUTER WILL FOLLOW \
__  63 DT  13,0¬/2,13¬/40,0¬/YOUR PROGRESS THROUGHOUT THE COURSE \
__  64 DT  16,0¬/2,16¬/40,0¬/AND WILL ADVISE YOU WHEN A REVIEW \
__  65 DT  19,0¬/2,19¬/40,0¬/OPTION IS COMING UP.  <S>O FEEL FREE TO \
__  66 DT  22,0¬/2,22¬/40,0¬/EXERCISE THE REVIEW OPTION.  <I>T WAS \
__  67 DT  25,0¬/2,25¬/40,0¬/DESIGNED WITH YOU %%%%___ IN MIND.\
__  68 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  69 DE  0¬/32\
__  70 FN  XP¬/4¬/0¬/9¬/<RELAX>\
__  71 FN  XP¬/4¬/9¬/2¬/<AND ENJOY>\
```

```
SEG1
__   72 FN  XP¬/4¬/20¬/0¬/<THE COURSE>\
__   73 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   74 DE  0¬/32\
__   75 DE  0¬/32\
GLOSS
__    1 DE  0¬/32\
__    2 CM  DRWMGK¬/0¬,0\
__   13 NO  COPY¬/DRWMGK-2¬,DRWMGK-13¬,SDRAW-5\
__   14 CM  DRWMGK¬/0¬,0\
__   27 FN  XP¬/2¬/16¬/4¬/<GLOSSARY OF TERMS >\
__   28 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   29 DE  0¬/32\
__   30 DTI 8,0¬/2,8¬/40,0¬/<C>OMPOSITE <F>ALSE <C>OLOR%%%%%%%%%%%%%%%%%
          %%%_____ - REFERS TO THE \
__   31 DTI 11,0¬/2,11¬/40,0¬/COLOR PRODUCED ON <L>ANDSAT MAPS COMPOSED \
__   32 DTI 14,0¬/2,14¬/40,0¬/OF DATA DERIVED FROM DIFFERENT SATELLITE\
__   33 DTI 17,0¬/2,17¬/40,0¬/SPECTRUM SCANS OF THE SAME AREA.\
__   34 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   35 DE  0¬/32\
__   36 DTI 6,0¬/2,6¬/40,0¬/<E>LECTROMAGNETIC <S>PECTRUM%%%%%%%%%%%%%%%%
          %%%%%%%_____ - REFERS TO THE\
__   37 DTI 9,0¬/2,9¬/40,0¬/ORDERED ARRAY OF KNOWN ELECTROMAGNETIC \
__   38 DTI 12.0¬/2,12¬/40,0¬/RADIATIONS EXTENDING FROM THE SHORTEST \
__   39 DTI 15,0¬/2,15¬/40,0¬/COSMIC RAYS%%%%%%%%%%_____,THROUGH G
          AMMA RAYS,<X>-RAYS,%%%%%%%%%%%%%%%%%%%%%%%%%%%%_____%%%%%%%%_____
                                \
__   40 DTI 18,0¬/2,18¬/40,0¬/ULTRAVIOLET RADIATION,VISIBLE RADIATION%%%%
          %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%
          ___\
__   41 DTI 21,0¬/2,21¬/40,0¬/INFRARED RADIATION,AND ALL OTHER WAVE %%%%%
          %%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%%\
__   42 DTI 24,0¬/2,24¬/40,0¬/LENGTHS OF RADIO ENERGY.\
__   43 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   44 DE  0¬/32\
__   45 DT  0,0¬/2,0¬/40,0¬/<ERTS>-<E>ARTH <R>ESOURCES <T>ECHNOLOGY \
__   46 DT  2,0¬/2,2¬/40,0¬/<S>ATELLITE%%%%%%%%_____ - FORMERLY THE
          NAME OF <L>ANDSAT\
__   47 DT  4,0¬/2,4¬/40,0¬/SATELLITES.\
__   48 DT  7,0¬/2,7¬/40,0¬/<I>NFRA-RED <F>ALSE <C>OLOR%%%%%%%%%%%%%%%%%
          %%%_____ - REFERS TO THAT \
__   49 DT  10,0¬/2,10¬/40,0¬/PORTION OF THE SPECTRUM CORRESPONDING TO \
__   50 DT  13,0¬/2,13¬/40,0¬/INFRA-RED, AND USED TO DELINEATE \
__   51 DT  16,0¬/2,16¬/40,0¬/VEGETATION (GREEN) ON <L>ANDSAT MAPS.\
__   52 DTI 21,0¬/2,21¬/40,0¬/<L>ANDSAT%%%%%%%_____ - REFERS TO <L>ANDS
          AT SATELLITES \
__   53 DTI 24,0¬/2,24¬/40,0¬/SCANNING THE SURFACES OF THE EARTH FROM \
__   54 DTI 27,0¬/2,27¬/40,0¬/AN ALTITUDE OF APPROXIMATELY 929KM HIGH.\
__   55 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   56 DE  0¬/32\
__   57 DT  0,0¬/2,0¬/40,0¬/<L>ANDSAT <M>AP%%%%%%%%%%_____ - REFER
          S TO A REPRESENTATION\
__   58 DT  3,0¬/2,3¬/40,0¬/OF THE LAND SURFACE OF THE EARTH \
__   59 DT  6,0¬/2,6¬/40,0¬/PRODUCED WITH THE AID OF A <L>ANDSAT \
```

```
GLOSS
    60 DT  9,0¬/2,9¬/40,0¬/SATELLITE.\
    61 DT  13,0¬/2,13¬/40,0¬/<M>ILLIMICRON%%%%%%%%%%_____ - <A >F
           ORMER UNIT EQUAL TO \
    62 DT  16,0¬/2,16¬/40,0¬/10 TO THE -9M; REDESIGNATED NANOMETER\
    63 DT  19,0¬/2,19¬/40,0¬/UNDER THE '<I>NTERNATIONAL <S>YSTEM OF \
    64 DT  22,0¬/2,22¬/40,0¬/<U>NITS'.\
    65 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    66 DE  0¬/32\
    67 DT  0,0¬/2,0¬/40,0¬/<N>ON <V>ISIBLE <L>IGHT <S>PECTRUM%%%%%%%%%%
           %%%%%%%%%%%%%%%%_____ - REFERS TO \
    68 DT  3,0¬/2,3¬/40,0¬/THAT PORTION OF THE LIGHT SPECTRUM NOT \
    69 DT  6,0¬/2,6¬/40,0¬/VISIBLE TO THE HUMAN EYE.\
    70 DT  10,0¬/2,10¬/40,0¬/<P>OLAR <O>RBIT - REFERS TO THE ORBIT OF A
           \
    71 DT  13,0¬/2,13¬/40,0¬/SATELLITE WHERE THE PATH IS OVER THE \
    72 DT  16,0¬/2,16¬/40,0¬/EARTH'S POLES.\
    73 DTI 20,0¬/2,20¬/40,0¬/<R>ADIATION%%%%%%%%_____ - <T>HE EMISS
           ION AND PROPAGATION\
    74 DTI 23,0¬/2,23¬/40,0¬/OF ENERGY THROGH SPACE IN THE FORM OF \
    75 DTI 26,0¬/2,26¬/40,0¬/WAVES.  <T>HE PROCESS OF EMITTING RADIANT \
    76 DTI 29,0¬/2,29¬/40,0¬/ENERGY.\
    77 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    78 DE  0¬/32\
    79 DT  4,0¬/2,4¬/40,0¬/<R>EMOTE <S>ENSING %%%%%%%%%%%%%%_____
               - MEANS SENSING THINGS \
    80 DT  7,0¬/2,7¬/40,0¬/AT A DISTANCE; THAT IS, DETECTING AND \
    81 DT  10,0¬/2,10¬/40,0¬/MEASURING SOME PROPERTY OF AN OBJECT \
    82 DT  13,0¬/2,13¬/40,0¬/WITHOUT ACTUALLY COMING INTO CONTACT \
    83 DT  16,0¬/2,16¬/40,0¬/WITH IT.\
    84 DT  20,0¬/2,20¬/40,0¬/<V>ISIBLE <L>IGHT <S>PECTRUM%%%%%%%%%%%%%%
           %%%%%%%_____ - REFERS TO THAT \
    85 DT  23,0¬/2,23¬/40,0¬/PORTION OF THE LIGHT SPECTRUM VISIBLE \
    86 DT  26,0¬/2,26¬/40,0¬/TO THE HUMAN EYE.  \
    87 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    88 DE  0¬/32\
    89 FN  XP¬/3¬/16¬/2¬/<INTRODUCTION>\
    90 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG1A
     1 DE  2¬/30\
     2 DTI 0,0¬/2,0¬/40,0¬/<W>E SEE MOST OF THE OBJECTS ABOUT US \
     3 DTI 3,0¬/2,3¬/40,0¬/BY REFLECTED LIGHT.  <I>F WE TURN OFF \
     4 DTI 6,0¬/2,6¬/40,0¬/THE LIGHTS, WE NO LONGER SEE ANYTHING;\
     5 DTI 9,0¬/2,9¬/40,0¬/THERE ARE NO LIGHT RAYS  FOR THE \
     6 DTI 12,0¬/2,12¬/40,0¬/OBJECTS TO REFLECT.\
     7 DTI 16,0¬/2,16¬/40,0¬/<A>N EYE IS LIKE A CAMERA.  <E>ACH HAS A \
     8 DTI 19,0¬/2,19¬/40,0¬/LENS; IN THE CASE OF THE EYE THE SCENE \
     9 DTI 22,0¬/2,22¬/40,0¬/IS FOCUSED ON THE RETINA; IN THE CASE \
    10 DTI 25,0¬/2,25¬/40,0¬/OF A CAMERA, IT IS FOCUSED ON A FILM.\
    11 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    12 DE  0¬/32\
    13 DTI 4,0¬/2,4¬/40,0¬/<A>S YOU KNOW WE ARE USED TO SEEING THINGS\
    14 DTI 7,0¬/2,7¬/40,0¬/IN COLOR.  <L>ETS HAVE A LOOK AT THE \
    15 DT  10,0¬/2,10¬/40,0¬/<ELECTROMAGNETIC SPECTRUM >WHICH \
```

```
SEG1A
    16 DTI 13,0¬/2,13¬/40,0¬/ILLUSTRATES THE COMPLETE RANGE OF \
    17 DTI 16,0¬/2,16¬/40,0¬/LIGHT WAVES FROM VERY SHORT WAVE \
    18 DTI 19,0¬/2,19¬/40,0¬/LENGTHS (<X>-RAYS) TO LONG WAVE LENGTHS \
    19 DTI 22,0¬/2,22¬/40,0¬/(RADIO WAVES) TO FIND OUT IN FACT \
    20 DT  25,0¬/2,25¬/40,0¬/HOW WE DO SEE.  \
    21 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG1B
     1 DE  0¬/32\
     2 DT  0,2¬/2,0¬/40,0¬/<W>HEN YOU EXAMINE THE 'ELECTROMAGNETIC \
     3 DT  3,0¬/2,3¬/40,0¬/SPECTRUM' ON THE NEXT SCREEN DISPLAY,\
     4 DT  6,0¬/2,6¬/40,0¬/PLEASE TAKE NOTE OF THE FOLLOWING \
     5 DT  9,0¬/2,9¬/40,0¬/INFORMATION: \
     6 DT  12,0¬/2,12¬/40,0¬/1. <T>HE HUMAN EYE CAN ONLY SEE A SMALL \
     7 DT  15,0¬/2,15¬/40,0¬/PART OF THE SPECTRUM.  <M>ORE SPECIFIC-\
     8 DT  18,0¬/2,18¬/40,0¬/ALLY, BETWEEN .400 AND .700 MILLICRONS.\
     9 DT  21,0¬/2,21¬/40,0¬/2.  <T>HE WAVE LENGTH BAND COLORS IN THIS \
    10 DT  24,0¬/2,24¬/40,0¬/VISIBLE RANGE INCLUDE BLUE, GREEN \
    11 DT  27,0¬/2,27¬/40,0¬/AND RED.  <T>HE RANGE IS FROM ULTRAVIOLET \
    12 DT  30,0¬/2,30¬/40,0¬/TO NEAR INFRA-RED.\
    13 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    14 DE  0¬/32\
    15 DT  0,7¬/2,0¬/40,0¬/¬E¬L¬E¬C¬T¬R¬O¬M¬A¬G¬N¬E¬T¬I¬C ¬S¬P¬E¬C¬T¬R¬U
           ¬M \
    16 DT  4,12¬/2,4¬/40,0¬/*                                          P
           PPP\
    17 DT  6,0¬/2,6¬/40,0¬/<X>-<RAYS ULTRA>-<VIOLET INFRARED MICROWAVE >
           \
    18 DL  8,0¬/40\
    19 DT  11,7¬/2,11¬/40,0¬/.400MC .500MC .600MC .700MC\
    20 DL  13,7¬/32\
    21 DT  15,7¬/2,15¬/40,0¬/¬B¬L¬U¬E\
    22 DTI 15,15¬/2,15¬/25,15¬/<,¬G¬R¬E¬E¬N >\
    23 DTI 15,22¬/2,15¬/18,22¬/<,¬R¬E¬D >\
    24 DL  17,7¬/32\
    25 DT  19,9¬/2,19¬/40,0¬/'¬V¬I¬S¬I¬B¬L¬E ¬S¬P¬E¬C¬T¬R¬U¬M' \
    26 PRR \
    27 DT  24,0¬/2,24¬/40,0¬/<N>OTE%%%%____ - 1 <M>ILLIMICRON = 0.000000
           001METERS\
    28 DT  27,0¬/2,27¬/40,0¬/        =1 X 10 TO THE POWER OF -9 METERS||
           ||||||||||\
    29 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG1C
     1 DE  0¬/32\
     2 DTI 3,2¬/2,3¬/38,2¬/<A>S YOU CAN SEE, THE EYE (OUR SENSOR) \
     3 DTI 6,0¬/2,6¬/40,0¬/IS ONLY SENSITIVE TO A VERY SMALL \
     4 DTI 9,0¬/2,9¬/40,0¬/PART OF THE ¬E¬L¬E¬C¬T¬R¬O¬M¬A¬G¬N¬E¬T¬I¬C ¬S
           ¬P¬E¬C¬T¬R¬U¬M.        <MAGNETIC SPECTRUM>.\
     5 DTI 13,2¬/2,13¬/38,2¬/<C>AMERAS ARE ALSO SENSORS WHICH OPERATE \
     6 DTI 16,0¬/2,16¬/40,0¬/IN THE VISIBLE REGION AND PRODUCE \
     7 DTI 19,0¬/2,19¬/40,0¬/A PERMANENT RECORD OF WHAT THE EYE \
     8 DTI 22,0¬/2,22¬/40,0¬/SEES.\
     9 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    10 DE  0¬/32\
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```
SEG1C
    11 DTI 8,2¬/2,8¬/40,0¬/<O>THER SENSORS HAVE BEEN DEVELOPED \
    12 DTI 11,0¬/2,11¬/40,0¬/WHICH CAN <SEE%%%>___ IN THOSE PARTS OF THE
         \
    13 DTI 14,0¬/2,14¬/40,0¬/SPECTRUM WHICH LIE ABOVE (<I>NFRARED) \
    14 DTI 17,0¬/2,17¬/40,0¬/AND BELOW(ULTRAVIOLET) THE <VISIBLE%%%%%%%>
         _______          \
    15 DTI 20,0¬/2,20¬/40,0¬/REGION.  \
    16 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    17 DE  0¬/32\
    18 DTI 0,2¬/2,0¬/40,0¬/<T>HESE SENSORS HAVE BEEN PLACED \
    19 DTI 3,0¬/2,3¬/40,0¬/ABOARD SATELLITES THAT ARE ORBITING \
    20 DTI 6,0¬/2,6¬/40,0¬/THE EARTH TAKING PHOTOGRAPHS OF ITS \
    21 DTI 9,0¬/2,9¬/40,0¬/SURFACE.  \
    22 DTI 12,2¬/2,12¬/40,0¬/<T>HIS ART OF ACQUIRING INFORMATION \
    23 DTI 15,0¬/2,15¬/40,0¬/ABOUT MATERIAL OBJECTS FROM \
    24 DTI 18,0¬/2,18¬/40,0¬/MEASUREMENTS MADE AT A DISTANCE \
    25 DTI 21,0¬/2,21¬/40,0¬/WITHOUT ACTUALLY TOUCHING THE \
    26 DTI 24,0¬/2,24¬/40,0¬/OBJECTS IS KNOWN AS:                    \
    27 DTI 27,12¬/2,27¬/40,0¬/¬R¬E¬M¬O¬T¬E ¬S¬E¬N¬S¬I¬N¬G \
    28 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEGLD
     1 DE  0¬/32\
     2 DT  0,0¬/2,0¬/40,0¬/<W>HICH OF THE FOLLOWING ARE ¬N¬O¬T%%%___ \
     3 DTI 3,0¬/2,3¬/40,0¬/EXAMPLES OF <REMOTE SENSING>?\
     4 DTI 8,0¬/2,8¬/40,0¬/¬A  <W>ATCHING A MOON LANDING ON <T V>.\
     5 DTI 12,0¬/2,12¬/40,0¬/¬B  <L>ISTENING TO THE RADIO.\
     6 DTI 16,0¬/2,16¬/40,0¬/¬C  <Y>OU FEEL THE FLOOR BENEATH YOUR FEET
          \
     7 DTI 18,0¬/2,18¬/40,0¬/   TO BE WET.\
     8 DTI 22,0¬/2,22¬/40,0¬/¬D  <W>ATCHING A HORSE RACE.\
     9 EPP ¬/SEGLD -009\
    10 NX  \
    11 DT  26,0¬/2,26¬/40,0¬/<Y>OU TOOK TO LONG IN MAKING A RESPONSE.\
    12 DT  28,0¬/2,28¬/40,0¬/<R>EMOTE SENSING IMPLIES DISTANCE ¬F¬R¬O¬M.
          \
    13 BR  RE\
    14 WAP 2,8,40,0¬/W0\
    15 DTI 8,0¬/2,8¬/40,0¬/\
    16 WAP 2,12,40,0¬/W1\
    17 DTI 12,0¬/2,12¬/40,0¬/\
    18 CAP 2,16,40,0¬/C2\
    19 DTI 26,0¬/2,26¬/40,0¬/<R>IGHT ON!\
    20 WAP 2,22,40,0¬/W3\
    21 DTI 22,0¬/2,22¬/40,0¬/\
    22 UN  U4\
    23 DTI 26,0¬/2,26¬/40,0¬/<H>INT! <D>IRECT TOUCH IS NOT REMOTE SENSIN
          G\
    24 BR  RE\
    25 PR  \
    26 PAE \
SEG2
     1 DE  0¬/32\
     2 FN  XP¬/4/10¬/5¬/<LANDSAT>\
```

```
SEG2
     3 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
     4 DE  0¬/32\
     5 NO  COPY¬/DRWMTT-2¬,DRWMTT-35¬,SDRAW-8\
     6 CM  DRWMTT¬/0¬,0\
    40 NO  EM\
    41 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    42 DE  0¬/32\
    43 DT  0,16¬/2,0¬/40,0¬/<LANDSAT%%%%%%%>_______ \
    44 DT  5,2¬/2,5¬/40,0¬/<T>ODAY, THROUGH THE SERVICES OF SPACE \
    45 DT  8,0¬/2,8¬/40,0¬/TECHNOLOGY, MAPS OF THE EARTH'S SURFACE \
    46 DT  11,0¬/2,11¬/40,0¬/ARE BEING MADE BY ORBITING SATELLITES.  \
    47 DTI 14,0¬/2,14¬/40,0¬/<T>HESE LAND SATELLITE(LANDSAT) MAPS WERE \
    48 DT  17,0¬/2,17¬/40,0¬/PREVIOUSLY REFERRED TO AS <ERTS >MAPS \
    49 DT  20,0¬/2,20¬/40,0¬/(<E>ARTH <R>ESOURCES <T>ECHNOLOGY <S>ATELLI
           TE).\
    50 DT  24,2¬/2,24¬/40,0¬/<T>HE MAPS WERE FIRST OBTAINED WHEN \
    51 DT  27,0¬/2,27¬/40,0¬/<L>ANDSAT-1 WAS LAUNCHED ON <J>ULY 23,1972.
           \
    52 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    53 DE  0¬/32\
    54 FN  XP¬/3¬/10¬/4¬/JULY 23 1972 \
    55 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    56 DE  0¬/32\
    57 FN  XP¬/3¬/6¬/4¬/<GOT THAT>!\
    58 FN  XP¬/3¬/18¬/4¬/<JULY >23 1972\
    59 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG2A
     1 PRR \
     2 DE  0¬/32\
     3 DT  0,2¬/2,0¬/40,0¬/<PLEASE ANSWER THE FOLLOWING QUESTIONS>\
     4 DTI 5,1¬/2,5¬/40,0¬/1. <O>N WHAT DATE WAS <L>ANDSAT-1 LAUNCHED?
             1.  .1  <O>N WHAT DATE WAS <L>ANDSAT-1 LAUNCHED?\
     5 DTI 7,4¬/2,7¬/40,0¬/(<S>PECIFY MONTH DAY AND YEAR)\
     6 LD  JULY 23 72 7¬/B1\
     7 EPI 10,4¬/2,10¬/36,4¬/600¬/99¬/SEG2A -007\
     8 NX  \
     9 DT  28,0¬/2,28¬/40,0¬/<S>LOWPOKE! <I >HAVE IT TO YOU ¬T¬W¬I¬C¬E!!
           !\
    10 BR  RE\
    11 FN2 COD¬/1,1\
    12 FN2 SQ¬/CO¬/((1.2.3)+(4.2.3))\
    13 DE  0¬/32\
    14 NO  COPY¬/DRWMEU-2¬,DRWMEU-17¬,SDRAW-5\
    15 CM  DRWMEU¬/0¬,0\
    31 NO  EM\
    32 FN  XP¬/4¬/26¬/8¬/<GREAT>\
    33 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    34 BR  SEG2B\
    35 UN  U1\
    36 DT  28,0¬/2,28¬/40,0¬/<H>INT! <T>RY THE EARLY 1970'S.\
    37 FN2 SQ¬/C2¬/((1+4).3)\
    38 DT  28,0¬/2,28¬/40,0¬/<Y>ES! <J>ULY 23 1972\
    39 UN  U3\
```

```
SEG2A
__   40 DE  0¬/32\
__   41 NO  COPY¬/DRW2CS-2¬,DRW2CS-39¬,SDRAW-1\
__   42 CM  DRW2CS¬/0¬,0\
__   68 NO  EM\
__   69 DTI 28,0¬/2,28¬/40,0¬/TYPE <J>ULY 23 1972\
__   70 DTI 30,39¬/2,30¬/40,0¬/¬;\
__   71 PAE \
__   72 DT  30,39¬/2,30¬/40,0¬/\
__   73 BR  PRO\
SEG2B
__    1 PRR \
__    2 DE  0¬/32\
__    3 DT  0,11¬/2,0¬/40,0¬/<SATELLITE SENSORS%%%%%%%%%%%%%%%%>_____
              _____\
__    4 DTI 6,0¬/2,6¬/40,0¬/<T>HERE ARE TWO SENSORS ON BOARD EACH \
__    5 DTI 9,0¬/2,9¬/40,0¬/SATELLITE WHICH TRANSMIT <C>ANADIAN \
__    6 DTI 12,0¬/2,12¬/40,0¬/IMAGE DATA TO SATELLITE RECEIVING \
__    7 DT  15,0¬/2,15¬/40,0¬/STATIONS AT <P>RINCE <A>LBERT%%%%%%%%%%%%_
              _____, <S>ASKATCHEWAN \
__    8 DTI 18,0¬/2,18¬/40,0¬/AND <S>HOE <C>OVE%%%%%%%%%_____ , <N>EW
              FOUNDLAND.  \
__    9 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   10 DE  0¬/32\
__   11 DTI 14,0¬/2,14¬/40,0¬/<T>HE <R>ETURN <B>EAM <V>IDECON(<RBV>) TAKE
              S\
__   12 DTI 17,0¬/2,17¬/40,0¬/PHOTOGRAPHS OF THE EARTH IN THREE \
__   13 DTI 20,0¬/2,20¬/40,0¬/WAVE LENGTH BANDS CORRESPONDING \
__   14 DTI 23,0¬/2,23¬/40,0¬/TO THE COLORS <GREEN>,<RED >AND NEAR%%%%%%%
              %%%%%%%%%%%____ %_ ___\
__   15 DTI 26,0¬/2,26¬/40,0¬/<INFRARED%%%%%%%%>_____.%%%%%%%%_____
              \
__   16 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   17 DE  0¬/32\
__   18 DT  8,2¬/2,8¬/40,0¬/<T>HE <M>ULTISPECTRAL <S>CANNER SWEEPS AN \
__   19 DT  11,0¬/2,11¬/40,0¬/AREA CONTINUOUSLY FROM SIDE TO SIDE \
__   20 DT  14,0¬/2,14¬/40,0¬/RECORDING EACH SCENE IN FOUR WAVE \
__   21 DT  17,0¬/2,17¬/40,0¬/LENGTH BANDS (4,5,6,AND 7)\
__   22 DT  20,0¬/2,20¬/40,0¬/SIMULTANEOUSLY.\
__   23 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   24 DE  0¬/32\
__   25 DTI 0,3¬/2,0¬/40,0¬/<T>HE IMAGES THAT ARE PRODUCED HAVE A \
__   26 DTI 3,0¬/2,3¬/40,0¬/SCALE OF 1:1 MILLION.(1 CM. EQUALS \
__   27 DTI 6,0¬/2,6¬/40,0¬/10 <K>M. THEY CAN BE ENLARGED TO A SCALE \
__   28 DTI 9,0¬/2,9¬/40,0¬/OF 1:250,000)\
__   29 DTI 13,3¬/2,13¬/40,0¬/<T>HE <L>ANDSAT IMAGES COVER AN AREA OF \
__   30 DTI 16,0¬/2,16¬/40,0¬/OVER 34,225 SQUARE KM. AND CAN SHOW \
__   31 DT  19,0¬/2,19¬/40,0¬/FEATURES 30 METRES AND LARGER.  \
__   32 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   33 DE  0¬/32\
__   34 FN  XP¬/4¬/16¬/4¬/<SCALE>\
__   35 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   36 DE  0¬/32\
__   37 FN  XP¬/3¬/4¬/4¬/<REMEMBER>\
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SEG2B
__   38 DTI 12,0¬/2,12¬/40,0¬/<T>HE IMAGES THAT ARE PRODUCED HAVE A \
__   39 DTI 15,0¬/2,15¬/40,0¬/SCALE OF :-\
__   40 FN  XP¬/3¬/20¬/4¬/L:LMILLIDN.\
__   41 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   42 DE  0¬/32\
SEG2C
__    1 PRR \
__    2 DE  0¬/32\
__    3 DE  0¬/32\
__    4 DTI 4,9¬/2,4¬/40,0¬/<HOW DATA IS RECEIVED >\
__    5 DL  6,9¬/20\
__    6 DTI 10,2¬/2,10¬/40,0¬/<E>ACH SATELLITE CONVERTS THE \
__    7 DTI 13,0¬/2,13¬/40,0¬/PHOTOGRAPHIC IMAGES TO RADIO SIGNALS \
__    8 DTI 16,0¬/2,16¬/40,0¬/WHICH ARE SENT TO THE GROUND \
__    9 DTI 19,0¬/2,19¬/40,0¬/RECEIVING STATIONS WHERE COMPUTERS \
__   10 DTI 22,0¬/2,22¬/40,0¬/RECONSTRUCT THE IMAGES FROM THE RADIO \
__   11 DTI 25,0¬/2,25¬/40,0¬/SIGNAL TO PRODUCE BLACK AND WHITE \
__   12 DTI 28,0¬/2,28¬/40,0¬/OR COMPOSITE FALSE COLOR IMAGES.\
__   13 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG2D
__    1 PRR \
__    2 DE  0¬/32\
__    3 DTI 3,4¬/2,3¬/40,0¬/<THE PASS QUICK LOOK SYSTEM>\
__    4 DL  5,4¬/26\
__    5 DTI 10,0¬/2,10¬/40,0¬/<T>HE '<P>ASS <Q>UICK <L>OOK <S>YSTEM' WAS\
__    6 DTI 13,0¬/2,13¬/40,0¬/DESIGNED TO ENABLE STATION PERSONNEL \
__    7 DTI 16,0¬/2,16¬/40,0¬/TO CHECK ON THE QUALITY OF THE DATA%%%%%%%%
           %%%% \
__    8 DTI 19,0¬/2,19¬/40,0¬/BEING RECEIVED, AND TO MAKE ANY \
__    9 DTI 22,0¬/2,22¬/40,0¬/CORRECTIONS THAT MIGHT PROVE \
__   10 DTI 25,0¬/2,25¬/40,0¬/NECESSARY.  \
__   11 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG2H
__    1 DE  0¬/32\
__    2 DTI 4,7¬/2,4¬/40,0¬/<INTEGRATED SATELLITE >\
__    3 DTI 6,5¬/2,6¬/40,0¬/<INFORMATIONS SERVICES LTD >\
__    4 DL  8,5¬/25\
__    5 DTI 12,0¬/2,12¬/40,0¬/<I>NFORMATION FROM SATELLITES IS \
__    6 DTI 15,0¬/2,15¬/40,0¬/RECORDED ON 28 TRACK TAPE WHICH IS \
__    7 DTI 18,0¬/2,18¬/40,0¬/THEN FED INTO A FORMATTER WHICH \
__    8 DTI 21,0¬/2,21¬/40,0¬/PREPARES THE DATA.  \
__    9 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG2F
__    1 PRR \
__    2 DE  0¬/32\
__    3 DTI 2,2¬/2,2¬/40,0¬/<T>HE FORMATTER OPERATES A 70MM CAMERA \
__    4 DTI 5,0¬/2,5¬/40,0¬/WHICH TAKES A COMPLETE PICTURE OF \
__    5 DTI 8,0¬/2,8¬/40,0¬/AN AREA 185KM <X >185KM SQ. OFF THE \
__    6 DTI 11,0¬/2,11¬/40,0¬/<C R T>.  <T>HE MASTER NEGATIVES ARE THEN \
__    7 DTI 14,0¬/2,14¬/40,0¬/DISTRIBUTED DAILY AS A SET OF \
__    8 DT  17,0¬/2,17¬/40,0¬/<MICROFICHE%%%%%%%%%%>__________ WHICH CAN
           BE OBTAINED \
__    9 DTI 20,0¬/2,20¬/40,0¬/FROM <ISIS L>TD. IN <P>RINCE <A>LBERT, \
```

```
SEG2F
    __   10 DTI 23,0¬/2,23¬/40,0¬/<S>ASKATCHEWAN, ON A SUBSCRIPTION BASIS. \
    __   11 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
<L>ISTA
    __    1 PRR \
    __    2 DE  0¬/32\
    __    3 DT  6,8¬/2,6¬/40,0¬/<THE EROS DATA CENTER >\
    __    4 DL  8,8¬/20\
    __    5 DT  12,3¬/2,12¬/40,0¬/<W>ORLD WIDE IMAGES AND TECHNICAL%%%%%%%%%
                %%%%%%%%%%%%%%%%%%%%_____________________________________\
    __    6 DT  15,0¬/2,15¬/40,0¬/INFORMATION PERTAINING TO THESE IMAGES \
    __    7 DTI 18,0¬/2,18¬/40,0¬/CAN BE OBTAINED FROM THE <E>ROS <D>ATA \
    __    8 DTI 21,0¬/2,21¬/40,0¬/<C>ENTER LOCATED AT <S>IOUX <F>ALLS, <S>OUT
                H\
    __    9 DTI 24,0¬/2,24¬/40,0¬/<D>AKOTA.\
    __   10 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
<H>IGHL
    __    1 PR  \
    __    2 DE  0¬/32\
    __    3 DT  0,8¬/2,0¬/40,0¬/<SERVICE AGENCY HIGHLIGHTS >\
    __    4 DT  4,0¬/2,4¬/40,0¬/1.  <P>ASS <Q>UICK <L>OOK <S>YSTEM - CHECKS O
                N \
    __    5 DT  7,5¬/2,7¬/40,0¬/THE QUALITY OF DATA RECEIVED.\
    __    6 DT  10,0¬/2,10¬/40,0¬/2.  <ISIS L>TD - <D>ISTRIBUTES A SET OF \
    __    7 DT  13,5¬/2,13¬/40,0¬/MICROFICHE DAILY.\
    __    8 DT  16,0¬/2,16¬/40,0¬/3.  <EROS D>ATA <C>ENTER - <P>ROVIDES WORLD
                \
    __    9 DT  19,5¬/2,19¬/40,0¬/WIDE IMAGES AND TECHNICAL INFORMATION \
    __   10 DT  22,5¬/2,22¬/40,0¬/ON WORLD WIDE IMAGES.\
    __   11 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
BRANCH
    __    1 PRR \
    __    2 DE  0¬/32\
    __    3 DT  0,0¬/2,0¬/40,0¬/<H>I <T>HERE!!! <J>UST THOUGHT <I >WOULD OFFE
                R \
    __    4 DT  2,0¬/2,2¬/40,0¬/YOU SOME ENCOURAGEMENT.  \
    __    5 DTI 6,0¬/2,6¬/40,0¬/<I >HAVE A COUPLE OF OPTIONS FOR YOU TO \
    __    6 DTI 8,0¬/2,8¬/40,0¬/THINK ABOUT.  <P>LEASE INDICATE YOUR \
    __    7 DTI 10,0¬/2,10¬/40,0¬/CHOICE WITH THE LIGHT PEN.\
    __    8 DT  16,3¬/2,16¬/40,0¬/¬A  <R>EVIEW THE SEGMENT JUST COMPLETED.\
    __    9 DT  24,3¬/2,24¬/40,0¬/¬B  <C>ONTINUE ON TO THE NEXT SEGMENT\
    __   10 EPP ¬/BRANCH-010\
    __   11 NX  \
    __   12 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
    __   13 CAP 4,16,40,0¬/C0\
    __   14 BR  SEG2B\
    __   15 CAP 4,24,40,0¬/C1\
    __   16 BR  QUIZ1\
    __   17 UN  U2\
    __   18 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
QUIZ1
    __    1 PRR \
    __    2 DE  0¬/32\
    __    3 DT  0,0¬/2,0¬/40,0¬/<USE THE LIGHT PEN TO INDICATE WHETHER >\
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QUIZ1
     4 DT  2,0¬/2,2¬/40,0¬/<THE STATEMENTS THAT FOLLOW ARE TRUE OR>\
     5 DT  4,0¬/2,4¬/40,0¬/<FALSE>.\
     6 DT  9,2¬/2,9¬/40,0¬/1.  <R>ADIO SIGNALS FROM SATELLITES CAN BE\
     7 DT  11,2¬/2,11¬/40,0¬/CONVERTED INTO BOTH BLACK & WHITE OR \
     8 DT  13,2¬/2,13¬/40,0¬/COMPOSITE FALSE COLOR IMAGES.\
     9 DT  16,2¬/2,16¬/40,0¬/¬T\
    10 DT  22,2¬/2,22¬/40,0¬/¬F\
    11 EPP ¬/QUIZ1 -011\
    12 NX  \
    13 DT  26,0¬/2,26¬/40,0¬/<Y>OUR TAKING TOO LONG!\
    14 DT  28,2¬/2,28¬/40,0¬/<T>RY AGAIN.\
    15 BR  RE\
    16 CAP 4,16,3,0¬/CO\
    17 DTI 28,0¬/2,28¬/40,0¬/<B>INGO!  <Y>OU HIT THE JACKPOT\
    18 PAE \
    19 WAP 4,22,3,0¬/W1\
    20 DT  28,0¬/2,28¬/40,0¬/<B>LACK & <W>HITE IMAGES ARE MADE FIRST.\
    21 UN  U2\
    22 DT  28,1¬/2,28¬/40,0¬/<P>LEASE POINT TO ¬T OR ¬F\
    23 PAE \
    24 BR  RE\
    25 PRR \
    26 DE  0¬/32\
    27 DT  9,2¬/2,9¬/40,0¬/2.  <C>ANADA HAS ONLY ONE SATELLITE \
    28 DT  11,2¬/2,11¬/40,0¬/RECEIVING STATION.\
    29 DT  16,2¬/2,16¬/40,0¬/¬T\
    30 DT  22,2¬/2,22¬/40,0¬/¬F\
    31 EPP ¬/QUIZ1 -031\
    32 NX  \
    33 DT  26,0¬/2,26¬/40,0¬/<T>OO LONG IN ANSWERING.\
    34 DT  28,0¬/2,28¬/40,0¬/<H>ERE WE GO AGAIN!\
    35 BR  RE\
    36 CAP 2,22,3,0¬/CO\
    37 DT  28,1¬/2,28¬/40,0¬/<Y>ES!! <T>HERE ARE TWO STATIONS.\
    38 PAE \
    39 WAP 4,16,3,0¬/W1\
    40 DT  28,1¬/2,28¬/40,0¬/<N>O! <T>HERE ARE TWO STATIONS.\
    41 UN  U2\
    42 DT  28,1¬/2,28¬/40,0¬/<P>LEASE POINT TO ¬T OR ¬F\
    43 BR  RE\
    44 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    45 PRR \
    46 DE  0¬/32\
    47 DT  9,2¬/2,9¬/40,0¬/3.  <U>SERS CAN OBTAIN MICROFICHE FROM \
    48 DT  11,6¬/2,11¬/40,0¬/<ISIS L>TD. ON A SUBSCRIPTION BASIS.\
    49 DT  16,2¬/2,16¬/40,0¬/¬T\
    50 DT  22,2¬/2,22¬/40,0¬/¬F\
    51 EPP ¬/QUIZ1 -051\
    52 NX  \
    53 DT  26,0¬/2,26¬/40,0¬/<F>ASTER PLEASE !\
    54 DT  28,0¬/2,28¬/40,0¬/<A>ROUND WE GO AGAIN.\
    55 BR  RE\
    56 CAP 4,16,3,0¬/CO\
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QUIZ1
___  57 DTI 26,0¬/4,26¬/40,0¬/<Y>OU'RE CORRECT!\
___  58 WAP 4,22,3,0¬/W1\
___  59 DT  26,0¬/2,26¬/40,0¬/<H>INT! <N>EGATIVES ARE PRODUCED DAILY.\
___  60 UN  U2\
___  61 DTI 26,5¬/4,26¬/40,0¬/<Y>OUR MAKING ME ANXIOUS <T>RY AGAIN!\
___  62 BR  RE\
___  63 PRR \
___  64 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
___  65 PRR \
___  66 DE  0¬/32\
___  67 DTI 9,0¬/2,9¬/40,0¬/<T>HE <PASS QUICK LOOK SYSTEM >IS DESIGNED\
___  68 DTI 11,0¬/2,11¬/40,0¬/TO CHECK ON THE QUALITY OF DATA RECEIVED.\
___  69 DTI 16,0¬/2,16¬/40,0¬/¬T\
___  70 DTI 22,0¬/2,22¬/40,0¬/¬F\
___  71 EPP ¬/QUIZ1 -071\
___  72 NX  \
___  73 DT  26;0¬/2,26¬/40,0¬/<C>LUE!  IMAGE QUALITY IS IMPORTANT.\
___  74 DT  28,0¬/2,28¬/40,0¬/<T>RY AGAIN.\
___  75 BR  RE\
___  76 CAP 4,16,3,0¬/CO\
___  77 DT  28,0¬/2,28¬/40,0¬/<Y>ES! <C>ORRECTIONS CAN BE MADE IMMEDIATEL
              Y\
___  78 WAP 4,22,3,0¬/W1\
___  79 DTI 28,0¬/4,28¬/40,0¬/<Y>OU NEED SOME SYSTEM OF QUALITY CONTROL.\
___  80 UN  U2\
___  81 DTI 28,0¬/4,28¬/40,0¬/<Y>OU'RE MAKING ME DIZZY!\
___  82 BR  RE\
___  83 PRR \
___  84 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG3
___   1 PRR \
___   2 DE  0¬/32\
___   3 DTI 0,0¬/2,0¬/40,0¬/<GENERAL CHARACTERISTICS OF WAVE BANDS >\
___   4 DL  2,1¬/37\
___   5 DTI 6,3¬/2,6¬/40,0¬/<W>E SAID EARLIER, THAT EACH SCENE IS \
___   6 DTI 9,0¬/2,9¬/40,0¬/RECORDED BY A MULTISPECTRAL SCANNER IN \
___   7 DTI 12,0¬/2,12¬/40,0¬/FOUR WAVE BANDS, <'B>ANDS 4,5,6 + 7<'>. \
___   8 DTI 15,3¬/2,15¬/40,0¬/<T>HE NEXT SCREEN DISPLAY WILL GIVE YOU \
___   9 DTI 18,0¬/2,18¬/40,0¬/A BRIEF DESCRIPTION OF USEFUL FEATURES \
___  10 DTI 21,0¬/2,21¬/40,0¬/PERCULIAR TO EACH WAVE LENGTH <BAND%%%%>___
              \
___  11 DTI 25,1¬/2,25¬/40,0¬/¬S¬O ¬P¬L¬E¬A¬S¬E ¬P¬A¬Y ¬A¬T¬T¬E¬N¬T¬I¬O¬N
              \
___  12 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG3A
___   1 PRR \
___   2 DE  0¬/32\
___   3 DTI 3,2¬/2,3¬/40,0¬/<I>N THE SECTION THAT FOLLOWS, WE WILL \
___   4 DTI 6,0¬/2,6¬/40,0¬/EXAMINE 4 DIFFERENT WAVE LENGTH <BANDS%%%%%>_
              ____ \
___   5 DTI 9,0¬/2,9¬/40,0¬/AND THE CHARACTERISTICS THATS ARE \
___   6 DTI 12,0¬/2,12¬/40,0¬/IMPORTANT FOR EACH BAND. \
___   7 DTI 15,2¬/2,15¬/40,0¬/<I>T IS EXTREMELY IMPORTANT THAT YOU \
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SEG3A
      8 DTI 18,0¬/2,18¬/40,0¬/PAY 'CLOSE ATTENTION' TO THE USE%%%___ \
      9 DTI 21,0¬/2,21¬/40,0¬/DESCRIBED FOR EACH OF THE <B>ANDS, AS \
     10 DTI 24,0¬/2,24¬/40,0¬/THIS KNOWLEDGE WILL HELP YOU INTERPRET \
     11 DTI 27,0¬/2,27¬/40,0¬/<L>ANDSAT IMAGES IN A SUBSEQUENT SECTION.\
     12 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
     13 DE  0¬/32\
     14 DT  10,0¬/2,10¬/40,0¬/<PLEASE FEEL FREE TO TAKE NOTES ON >\
     15 DT  13,0¬/2,13¬/40,0¬/<THIS SEGMENT AND ANY OTHER THAT >\
     16 DTI 16,0¬/2,16¬/40,0¬/<FOLLOWS>. \
     17 NO  COPY¬/DRWMGK-2¬,DRWMGK-13¬,SDRAW-5\
     18 CM  DRWMGK¬/0¬,0\
     30 NO  EM\
     31 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG3B
      1 PRR \
      2 DE  0¬/32\
      3 DTI 2,0¬/2,2¬/40,0¬/¬B¬A¬N¬D ¬4 - <R>ECORDING THE BLUE/GREEN \
      4 DTI 4,0¬/2,4¬/40,0¬/PORTION OF THE VISIBLE SPECTRUM LYING \
      5 DT  6;0¬/2,6¬/40,0¬/BETWEEN .500 AND .600 MILLIMICRONS IN \
      6 DT  8,0¬/2,8¬/40,0¬/WAVE LENGTH.  <B>AND 4 IS USEFUL FOR \
      7 DT  10,0¬/2,10¬/40,0¬/DETECTING CULTURAL FEATURES, VEGETATION\
      8 DT  12,0¬/2,12¬/40,0¬/CLASSIFICATIONS, GEOLOGICAL CLASSIF-\
      9 DT  14,0¬/2,14¬/40,0¬/ICATIONS, AND DETECTION OF TURBIDITY\
     10 DT  16,0¬/2,16¬/40,0¬/IN WATER.  \
     11 DT  19,0¬/2,19¬/40,0¬/¬B¬A¬N¬D ¬5 - <R>ECORDING IN THE RED PORTIO
             N OF\
     12 DT  21,0¬/2,21¬/40,0¬/THE VISIBLE SPECTRUM LYING BETWEEN \
     13 DT  23,0¬/2,23¬/40,0¬/.600 AND .700 MILLIMICRONS IN WAVE-\
     14 DT  25,0¬/2,25¬/40,0¬/LENGTH.  <B>AND 5 IS MOST USEFUL IN \
     15 DT  27,0¬/2,27¬/40,0¬/DISCRIMINATING VEGETATION TYPES AND THE \
     16 DT  29,0¬/2,29¬/40,0¬/DETECTION OF SOME CULTURAL FEATURES.  \
     17 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
     18 PRR \
     19 DE  0¬/32\
     20 DT  0,0¬/2,0¬/40,0¬/¬B¬A¬N¬D ¬6  <R>ECORDING IN THE NEAR INFRA-RE
             D \
     21 DT  2,0¬/2,2¬/40,0¬/PORTION OF THE SPECTRUM JUST BEYOND \
     22 DT  4,0¬/2,4¬/40,0¬/VISIBLE LYING BETWEEN .700 AND .800 \
     23 DT  6,0¬/2,6¬/40,0¬/MILLIMICRONS IN WAVE LENGTH.  <B>AND 6 \
     24 DT  8,0¬/2,8¬/40,0¬/IS MOST USEFUL FOR ITS WATER CHARACTER-\
     25 DT  10,0¬/2,10¬/40,0¬/ISTICS.  <A>S WATER ABSORBS INFRA-RED \
     26 DT  12,0¬/2,12¬/40,0¬/RADIATION, THERE WILL BE LITTLE, IF ANY \
     27 DT  14,0¬/2,14¬/40,0¬/INFRA-RED REFLECTION FROM THE WATER \
     28 DT  16,0¬/2,16¬/40,0¬/AND SO WATER AREAS WILL BE SHOWN AS \
     29 DT  18,0¬/2,18¬/40,0¬/BLACK.  <I>N ADDITION, THE INFRA-RED \
     30 DT  20,0¬/2,20¬/40,0¬/REFLECTANCE FROM VEGETATION IS ALSO\
     31 DT  22,0¬/2,22¬/40,0¬/BEING RECORDED.  <T>HIS VEGETATION \
     32 DT  24,0¬/2,24¬/40,0¬/REFLECTANCE IS MOST USEFUL FOR DETECTING\
     33 DT  26,0¬/2,26¬/40,0¬/CONIFER (LOW REFLECTANCE) AND DECIDUOUS \
     34 DT  28,0¬/2,28¬/40,0¬/(HIGH REFLECTANCE) FOREST AREAS.  \
     35 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
     36 PRR \
     37 DE  0¬/32\
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SEG3B
__   38 DT  0,0¬/2,0¬/40,0¬/¬B¬A¬N¬D ¬7  <R>ECORDING IN THE MODERATE/NEAR
              \
__   39 DT  2,0¬/2,2¬/40,0¬/INFRA-RED PORTION OF THE SPECTRUM WELL \
__   40 DT  4,0¬/2,4¬/40,0¬/BEYOND THE VISIBLE RANGE, LYING BETWEEN \
__   41 DT  6,0¬/2,6¬/40,0¬/.800 AND 1.00 MILLIMICRONS IN WAVE-\
__   42 DT  8,0¬/2,8¬/40,0¬/LENGTH.   <B>AND 7 RETAINS THE WATER \
__   43 DT  10,0¬/2,10¬/40,0¬/DETECTION CHARACTERISTIC BUT IN ADDITION\
__   44 DT  12,0¬/2,12¬/40,0¬/ALSO PICKS UP THE LOW REFLECTANCE OF \
__   45 DT  14,0¬/2,14¬/40,0¬/WET SOILS, SLOUGHS, MARSH AND MUSKEG.\
__   46 DT  16,0¬/2,16¬/40,0¬/<B>Y COMPARING <B>AND 6 TO <B>AND 7, OPEN \
__   47 DT  18,0¬/2,18¬/40,0¬/WATER BODIES MAY BE DISCRIMINATED FROM \
__   48 DT  20,0¬/2,20¬/40,0¬/THE WET SOIL CONDITIONS.  <I>N ADDITION, \
__   49 DT  22,0¬/2,22¬/40,0¬/<B>AND 7 PROVIDES MAXIMUM INFRA-RED \
__   50 DT  24,0¬/2,24¬/40,0¬/REFLECTANCE FROM VEGETATION, WHICH IS \
__   51 DT  26,0¬/2,26¬/40,0¬/USEFUL FOR DETECTING THE EXTENTS OF \
__   52 DT  28,0¬/2,28¬/40,0¬/BLIGHTS AND INSECT INFESTATIONS IN \
__   53 DT  30,0¬/2,30¬/40,0¬/CROPS AND FORESTS.  \
__   54 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   55 DE  0¬/32\
__   56 FN  XP¬/2¬/00¬/8¬/<HIGHTLIGHTS>\
__   57 FN  XP¬/2¬/07¬/17¬/<OF>\
__   58 FN  XP¬/2¬/16¬/4¬/<WAVE LENGTH BAND>\
__   59 FN  XP¬/2¬/26¬/4¬/<CHARACTERISTICS>\
__   60 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   61 DE  0¬/32\
__   62 DT  0,5¬/2,0¬/40,0¬/<T>HERE ARE 4 SCANNING DEVICES ON THE \
__   63 DT  3,0¬/2,3¬/40,0¬/SATELLITE.  <E>ACH ONE OF THEM IS \
__   64 DT  6,0¬/2,6¬/40,0¬/SENSITIVE TO A DIFFERENT PORTION OF THE \
__   65 DT  9,0¬/2,9¬/40,0¬/LIGHT SPECTRUM.  <T>HE SENSORS PRODUCE \
__   66 DT  12,0¬/2,12¬/40,0¬/WHAT ARE CALLED BAND 4, BAND 5, BAND 6,\
__   67 DT  15,0¬/2,15¬/40,0¬/AND BAND 7 IMAGES.\
__   68 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   69 DE  0¬/32\
__   70 DT  0,0¬/2,0¬/40,0¬/<B>AND 4 - <C>HARACTERISTICS%%%%%%%%%%%%%%%%
              %%%%%%%_____________________\
__   71 DT  2,0¬/2,2¬/40,0¬/<S>ENSITIVE TO THE BLUE GREEN PORTION OF \
__   72 DT  5,0¬/2,5¬/40,0¬/THE LIGHT SPECTRUM AND CAN SHOW DEPTH\
__   73 DT  8,0¬/2,8¬/40,0¬/AND OR TURBIDITY OF STANDING BODIES OF \
__   74 DT  11,0¬/2,11¬/40,0¬/WATER AND CULTURAL FEATURES SUCH AS \
__   75 DT  14,0¬/2,14¬/40,0¬/ROADS AND TOWNS.\
__   76 DT  17,0¬/2,17¬/40,0¬/<B>AND 5 - <C>HARACTERISTICS%%%%%%%%%%%%%%%%
              %%%%%%%%%_____________________\
__   77 DT  20,0¬/2,20¬/40,0¬/<S>ENSITIVE TO THE RED PORTION OF THE \
__   78 DT  23,0¬/2,23¬/40,0¬/LIGHT SPECTRUM AND SHOWS TOPOGRAPHICAL\
__   79 DT  26,0¬/2,26¬/40,0¬/AND CULTURAL FEATURES SUCH AS DRAINAGE \
__   80 DT  29,0¬/2,29¬/40,0¬/PATTERNS AND ALSO ROADS AND TOWNS.\
__   81 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   82 DE  0¬/32\
__   83 DT  0,0¬/2,0¬/40,0¬/<B>AND 6 - <C>HARACTERISTICS%%%%%%%%%%%%%%%%
              %%%%%%%_____________________ \
__   84 DT  3,0¬/2,3¬/40,0¬/<S>ENSITIVE TO THE NEAR INFRA-RED PORTION \
__   85 DT  6,0¬/2,6¬/40,0¬/OF THE SPECTRUM AND SHOWS TONAL \
__   86 DT  9,0¬/2,9¬/40,0¬/CONTRASTS THAT REFLECT VARIOUS LAND USE \
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SEG3B
__   87 DT  12,0¬/2,12¬/40,0¬/PRACTICES.\
__   88 DT  16,0¬/2,16¬/40,0¬/<B>AND 7 - <C>HARACTERISTICS%%%%%%%%%%%%%%%
          %%%%%%%%%_____________________\
__   89 DT  19,0¬/2,19¬/40,0¬/<S>ENSITIVE TO THE NEAR INFRA-RED PORTION\
__   90 DT  22,0¬/2,22¬/40,0¬/OF THE SPECTRUM SLIGHTLY HIGHER THAN\
__   91 DT  25,0¬/2,25¬/40,0¬/THE BAND 6, AND IS BEST FOR LAND AND \
__   92 DT  28,0¬/2,28¬/40,0¬/WATER DESCRIMINATION.\
__   93 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   94 DE  0¬/32\
__   95 DE  0¬/32\
SEG3C
__    1 PRR \
__    2 DE  0¬/32\
__    3 DT  0,0¬/2,0¬/40,0¬/      <COMPOSITE FALSE COLOR >(<C>1)\
__    4 DL  2,5¬/24\
__    5 DTI 5,2¬/2,5¬/40,0¬/<P>AGES 2 AND 3 OF YOUR CURRICULUM KIT \
__    6 DTI 7,0¬/2,7¬/40,0¬/SHOW TWO SCENES OF <W>INNIPEG IN \
__    7 DTI 9,0¬/2,9¬/40,0¬/COMPOSITE FALSE COLOR.\
__    8 DTI 13,2¬/2,13¬/38,2¬/<I>NDIVIDUAL WAVE BAND IMAGES MAY BE \
__    9 DTI 15,0¬/2,15¬/40,0¬/COMBINED INTO A STACK-LIKE SANDWICH.\
__   10 DTI 17,0¬/2,17¬/40,0¬/<I>F EACH SEPARATE IMAGE IN THE STACK IS \
__   11 DTI 19,0¬/2,19¬/40,0¬/THEN COLOR CODED,(I.E. <B>AND 4 PRINTED\
__   12 DTI 21,0¬/2,21¬/40,0¬/IN BLUE, <B>AND 5 PRINTED IN GREEN, AND\
__   13 DTI 23,0¬/2,23¬/40,0¬/<B>AND 7 PRINTED IN <R>ED), THE RESULT IS A
          \
__   14 DTI 26,0¬/2,26¬/40,0¬/¬C¬O¬M¬P¬O¬S¬I¬T¬E ¬F¬A¬L¬S¬E ¬C¬O¬L¬O¬R ¬I
          ¬M¬A¬G¬E.\
__   15 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   16 DE  0¬/32\
__   17 DT  16,3¬/2,16¬/40,0¬/<T>HIS COMPOSITE TYPE HAS BEEN USED \
__   18 DTI 19,0¬/2,19¬/40,0¬/TO ADVANTAGE IN AGRICULTURE,FORESTRY \
__   19 DTI 22,0¬/2,22¬/40,0¬/AND VEGETATION STRESS RELATED \
__   20 DTI 25,0¬/2,25¬/40,0¬/INVESTIGATIONS. \
__   21 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   22 PRR \
__   23 DE  0¬/32\
__   24 DT  0,0¬/2,0¬/40,0¬/<H>OWDY <P>ARTNER!!! <I >NOTICED YOU'RE \
__   25 DT  2,0¬/2,2¬/40,0¬/MOVING RIGHT ALONG.\
__   26 DTI 7,0¬/2,7¬/40,0¬/<I >HAVE SOME MORE OPTIONS FOR YOU!\
__   27 DT  16,3¬/2,16¬/40,0¬/¬A  <R>EVIEW THIS SEGMENT \
__   28 DT  24,3¬/2,24¬/40,0¬/¬B  <I >WOULD LIKE TO CONTINUE ON!\
__   29 PRR \
__   30 EPP ¬/SEG3C -030\
__   31 NX  \
__   32 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES\
__   33 CAP 4,16,40,0¬/CO\
__   34 BR  SEG3\
__   35 CAP 4,24,40,0¬/C1\
__   36 BR  PR1\
__   37 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
QUIZ2
__    1 PRR \
__    2 DE  0¬/32\
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QUIZ2
     3 DT  0,0¬/2,0¬/40,0¬/<P>LEASE ENTER THE APPROPRIATE WAVE LENGTH\
     4 DT  2,0¬/2,2¬/40,0¬/<B>AND <N>UMBER BESIDE ITS ASSOCIATED USE.\
     5 DT  4,0¬/2,4¬/40,0¬/<U>SE A NUMBER BETWEEN 4 AND 7 ¬O¬N¬L¬Y.\
     6 DT  8,0¬/2,8¬/40,0¬/1.     <D>ETECTS LOW REFLECTANCE OF WET\
     7 DT  10,6¬/2,10¬/40,0¬/SOILS, MARSH, AND THE EXTENT OF \
     8 DT  12,6¬/2,12¬/40,0¬/BLIGHT AND INSECT INFESTATIONS \
     9 DT  14,6¬/2,14¬/40,0¬/IN CROPS AND FORESTS.\
    10 DT  19,0¬/2,19¬/40,0¬/2.    <U>SEFUL FOR ITS WATER CHARACTER-\
    11 DT  21,6¬/2,21¬/40,0¬/ISTICS AND DECTECTION OF CONIFERS \
    12 DT  23,6¬/2,23¬/40,0¬/AND DECIDUOUS FOREST AREAS.\
    13 LD  <B>AND 7 4 5 6¬/B1\
    14 EPI 8,2¬/2,8¬/4,2¬/600¬/4¬/QUIZ2 -014\
    15 NX  \
    16 DT  28,0¬/2,28¬/40,0¬/<E>VEN TURTLES ARE FASTER !!!\
    17 BR  RE\
    18 FN2 COD¬/1,1\
    19 FN2 SQ¬/CO¬/('2)\
    20 DT  28,0¬/2,28¬/40,0¬/<Y>OU'RE ON YOUR WAY!!!\
    21 FN2 SQ¬/W1¬/(3+4+5)\
    22 DT  28,0¬/2,28¬/40,0¬/<H>INT! <L>OOK AT THE SPECTRUM'S HIGH END.\
    23 UN  U2\
    24 DT  28,0¬/2,28¬/40,0¬/<C>LUE! <B>ETWEEN .800-.1,100 MILLICRONS\
    25 UN  U3\
    26 DT  28,0¬/2,28¬/40,0¬/<T>YPE 7\
    27 PRR \
    28 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    29 LD  <B>AND 6 4 5 7¬/B1\
    30 EPI 19,2¬/2,19¬/1,2¬/600¬/4¬/QUIZ2 -030\
    31 NX  \
    32 DT  28,0¬/2,28¬/40,0¬/SLEEPY HEAD!!!\
    33 BR  RE\
    34 FN2 COD¬/1,1\
    35 FN2 SQ¬/CO¬/('2)\
    36 DT  28,2¬/2,28¬/40,0¬/<S>MASHING!!! <O>LD <C>HAP\
    37 FN2 SQ¬/W1¬/(3+4+5)\
    38 DT  28,2¬/2,28¬/40,0¬/<C>LUE! <B>ETWEEN .700-.800 <M>ILLICRONS.\
    39 UN  U2\
    40 DTI 28,0¬/2,28¬/40,0¬/.700-.800 IS AT THE SPECTRUM'S HIGH END \
    41 UN  U3\
    42 DT  28,0¬/2,28¬/40,0¬/<T>YPE 6\
    43 PRR \
    44 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG3D
     1 PRR \
     2 DE  0¬/32\
     3 DT  2,0¬/2,2¬/40,0¬/<PLEASE ENTER THE APPROPRIATE WAVE LENGTH>\
     4 DT  4,0¬/2,4¬/40,0¬/<LENGTH BAND NUMBER BESIDE ITS ASSOCIATED>\
     5 DT  6,0¬/2,6¬/40,0¬/<USE>.  <U>SE A ¬O¬N¬E ¬D¬I¬G¬I¬T NUMBER ONLY
           .\
     6 DT  9,0¬/2,9¬/40,0¬/3.     <D>ESCRIMINATES VEGETATION TYPES.\
     7 DT  11,6¬/2,11¬/40,0¬/AND IDENTIFYS CULTURAL FEATURES.\
     8 DT  16,0¬/2,16¬/40,0¬/4.     <D>ETECTS CULTURAL FEATURES, VEGET-\
     9 DT  18,6¬/2,18¬/40,0¬/ATION  CLASSIFICATIONS AND TURBID
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SEG3D          CLASSIFICATIONS AND TURBID WATER.\
    10 DT  20,6¬/2,20¬/40,0¬/WATER.\
    11 LO  <B>AND 5 4 6 7¬/B1\
    12 EPI 9,3¬/2,9¬/1,3¬/600¬/4¬/SEG3D -012\
    13 NX  \
    14 DT  28,0¬/2,28¬/40,0¬/<Y>OUR SLIPPING AWAY ON ME - <T>RY AGAIN!\
    15 BR  RE\
    16 FN2 COD¬/1,1\
    17 FN2 SQ¬/CO¬/('2)\
    18 DT  28,0¬/2,28¬/40,0¬/<T>HAT MAKES YOU NUMERO UNO!!!\
    19 FN2 SQ¬/W1¬/(3+4+5)\
    20 DT  28,0¬/2,28¬/40,0¬/<C>LUE! <B>ETWEEN .600 AND .700 <M>ILLICRON
            S \
    21 UN  U2\
    22 DT  28,0¬/2,28¬/40,0¬/<C>LUE .600-.700 IS BELOW <B>AND 6\
    23 UN  U3\
    24 DT  28,0¬/2,28¬/40,0¬/<T>YPE 5\
    25 PRR \
    26 LD  <B>AND 4 5 6 7¬/B1\
    27 EPI 16,3¬/2,16¬/1,3¬/600¬/4¬/SEG3D -027\
    28 NX  \
    29 DT  28,0¬/2,28¬/40,0¬/<Y>OU JUST PUT ME TO SLEEP\
    30 FN2 COD¬/1,1\
    31 FN2 SQ¬/CO¬/('2)\
    32 DT  28,0¬/2,28¬/40,0¬/<I >AM BEGINNING TO LIKE YOU!!\
    33 FN2 SQ¬/W1¬/(3+4+5)\
    34 DT  28,0¬/2,28¬/40,0¬/<C>LUE! <B>ETWEEN .500-.600 MILLICRONS.\
    35 UN  U2\
    36 DT  28,0¬/2,28¬/40,0¬/<H>INT! .500-.600MC IS BELOW <B>AND 5\
    37 UN  U3\
    38 DT  28,0¬/2,28¬/40,0¬/TYPE 4\
    39 BR  RE\
SEG4
     1 PRR \
     2 DE  0¬/32\
     3 DT  1,6¬/2,1¬/40,0¬/<INTERPRETATION TECHNIQUES >\
     4 DL  3,6¬/25\
     5 DT  6,1¬/2,6¬/40,0¬/<S>INCE YOU WILL BE WORKING WITH TWO \
     6 DTI 9,1¬/2,9¬/40,0¬/COMPOSITE FALSE COLOR IMAGES, IT IS \
     7 DTI 12,1¬/2,12¬/40,0¬/¬V¬E¬R¬Y ¬I¬M¬P¬O¬R¬T¬A¬N¬T YOU BECOME FAMI
            LIAR WITH\
     8 DTI 15,1¬/2,15¬/40,0¬/COLORS PRODUCED BY COLOR 'INFRARED' \
     9 DTI 18,1¬/2,18¬/40,0¬/FILM.  <S>O PLEASE PAY ¬C¬L¬O¬S¬E ¬A¬T¬T¬E¬
            N¬T¬I¬O¬N \
    10 DTI 21,1¬/2,21¬/40,0¬/TO THE CHART WHICH WILL BE DISPLAYED \
    11 DTI 24,1¬/2,24¬/40,0¬/MOMENTARILY.\
    12 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    13 PRR \
    14 DE  0¬/32\
    15 DT  0,1¬/2,0¬/40,0¬/<COLORS PRODUCED BY COLOR INFRARED FILM >\
    16 DL  3,1¬/38\
    17 DTI 5,0¬/2,5¬/40,0¬/<T>HE CHART INDICATES THE <NATURAL%%%%%%%>___
            ____ COLOR\
    18 DTI 7.0¬/2,7¬/40,0¬/OF DIFFERENT VEGETATION AND ALSO THE \
```

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SEG4
__  19 DTI 9,0¬/2,9¬/40,0¬/COLOR THIS SAME VEGETATION WOULD APPEAR\
__  20 DT  11,0¬/2,11¬/40,0¬/ON <INFRARED FILM>.%%%%%%%%%%%%%%%_____ _
       ___\
__  21 DTI 14,0¬/2,14¬/40,0¬/<T>HE COLORS YOU SEE NATURALLY WITH THE \
__  22 DTI 16,0¬/2,16¬/40,0¬/VISIBLE EYE ARE SHOWN ON THE ¬L¬E¬F¬T SIDE\
__  23 DTI 18,0¬/2,18¬/40,0¬/OF THE SCREEN.  <V>EGETATION AND OTHER \
__  24 DTI 20,0¬/2,20¬/40,0¬/SUBSTANCES IN ¬C¬O¬L¬O¬R ¬I¬N¬F¬R¬A¬R¬E¬D A
       RE SHOWN \
__  25 DT  22,0¬/2,22¬/40,0¬/ON THE ¬R¬I¬G¬H¬T SIDE OF THE SCREEN.  \
__  26 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG4A
__   1 PRR \
__   2 DE  0¬/32\
__   3 DT  0,14¬/2,0¬/40,0¬/¬V¬E¬G¬E¬T¬A¬T¬I¬O¬N  \
__   4 DT  3,0¬/2,3¬/40,0¬/¬N¬A¬T¬U¬R¬A¬L                          ¬C¬O¬L¬O
       ¬R\
__   5 DT  5,0¬/2,5¬/40,0¬/¬C¬O¬L¬O¬R        ¬E¬X¬A¬M¬P¬L¬E¬S        ¬I
       ¬N¬F¬R¬A¬R¬E¬D\
__   6 DT  8,0¬/2,8¬/40,0¬/<B>RIGHT   <H>EALTHY DECIDUOUS    <B>RIGHT\
__   7 DT  10,0¬/2,10¬/40,0¬/<G>REEN     TREES.              <R>ED\
__   8 DT  13,9¬/2,13¬/40,0¬/<G>REEN GRASSES       <P>INK\
__   9 DTI 16,9¬/2,16¬/40,0¬/<A>LGAE\
__  10 DT  19,0¬/2,19¬/40,0¬/<D>ULL/    <N>EEDLELEAF <T>REES     <M>AGEN
       TA/         /\
__  11 DT  21,0¬/2,21¬/40,0¬/<G>REEN    <S>HRUBS, <S>TRESSED     <P>URPL
       E\
__  12 DTI 23,9¬/2,23¬/40,0¬/<V>EGETATION.\
__  13 PRR \
__  14 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  15 DE  0¬/32\
__  16 DT  0,14¬/2,0¬/40,0¬/¬V¬E¬G¬E¬T¬A¬T¬I¬O¬N\
__  17 DT  3,0¬/2,3¬/40,0¬/¬N¬A¬T¬U¬R¬A¬L                          ¬C¬O¬L¬O¬
       R\
__  18 DT  5,0¬/2,5¬/40,0¬/¬C¬O¬L¬O¬R          ¬E¬X¬A¬M¬P¬L¬E¬S      ¬I¬
       N¬F¬R¬A¬R¬E¬D\
__  19 DT  13,0¬/2,13¬/40,0¬/<RED          A>UTUMN FOLIAGE/      <GREEN>
       /\
__  20 DT  15,0¬/2,15¬/40,0¬/             <L>OSS OF CHLOROPHYL   <YELLOW
       >\
__  21 DT  18,0¬/2,18¬/40,0¬/<WHITE        F>OREST <C>LEARING       <WHI
       TE>\
__  22 DTI 21,0¬/4,21¬/40,0¬/<YELLOW       W>HEAT                    <WHITE
              >WHEAT                          <W>HITE\
__  23 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  24 PRR \
__  25 DE  0¬/32\
__  26 DT  0,14¬/2,0¬/40,0¬/¬V¬E¬G¬E¬T¬A¬T¬I¬O¬N\
__  27 DT  3,0¬/2,3¬/40,0¬/¬N¬A¬T¬U¬R¬A¬L                          ¬C¬O¬L¬O¬
       R\
__  28 DT  5,0¬/2,5¬/40,0¬/¬C¬O¬L¬O¬R          ¬E¬X¬A¬M¬P¬L¬E¬S      ¬I¬
       N¬F¬R¬A¬R¬E¬D\
__  29 DT  8,8¬/2,8¬/40,0¬/¬O¬T¬H¬E¬R ¬S¬U¬B¬S¬T¬A¬N¬C¬E¬S\
__  30 DT  11,0¬/2,11¬/40,0¬/<RED      R>ED <S>OILS           <GREEN>/\
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SEG4A
__  31 DT  13,0¬/2,13¬/40,0¬/                                  <YELLOW>\
__  32 DT  21,0¬/2,21¬/40,0¬/<BLUE     C>LEAR <W>ATER              <BLACK>\
__  33 DT  26,0¬/2,26¬/40,0¬/<BLACK   D>ARK BARE SOIL          <BLUE>/\
__  34 DT  28,30¬/2,28¬/40,0¬/<BLACK>\
__  35 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  36 DE  0¬/32\
__  37 DT  0,11¬/2,0¬/40,0¬/<CHANGE DETECTION>\
__  38 DL  2,11¬/16\
__  39 DTI 5,2¬/2,5¬/40,0¬/<V>ISUAL COMPARISON OF TWO SATELLITE \
__  40 DT  7,0¬/2,7¬/40,0¬/IMAGES OF THE <SAME%%%%>____ AREA TAKEN 18 DA
          YS \
__  41 DT  9,0¬/2,9¬/40,0¬/APART, REVEALS MANY OF THE CHANGED \
__  42 DT  11,0¬/2,11¬/40,0¬/FEATURES IN A SCENE.  <H>OWEVER, FINDING \
__  43 DT  13,0¬/2,13¬/40,0¬/ALL OF THE CHANGED AREAS CAN BE TIME \
__  44 DT  15,0¬/2,15¬/40,0¬/CONSUMING.  \
__  45 DTI 18,2¬/2,18¬/40,0¬/<A >NEW TECHNIQUE KNOWN AS <CHANGE%%%%%%>__
          ____ \
__  46 DT  20,0¬/2,20¬/40,0¬/<DETECTION%%%%%%%%%>_________ ENABLES THESE
          CHANGES TO BE \
__  47 DT  22,0¬/2,22¬/40,0¬/RECOGNIZED WITHOUT THE VISIBLE IMAGE \
__  48 DT  24,0¬/2,24¬/40,0¬/BEING ACTUALLY CREATED.\
__  49 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  50 DE  0¬/32\
__  51 DT  6,2¬/2,6¬/40,0¬/<R>ECORDS OF THE SAME AREA FROM \
__  52 DTI 9,0¬/2,9¬/40,0¬/DIFFERENT PASSES OF THE SAME SATELLITE \
__  53 DTI 12,0¬/2,12¬/40,0¬/MAY BE COMPARED AUTOMATICALLY, AND \
__  54 DTI 15,0¬/2,15¬/40,0¬/ONLY THE DIFFERENCES BETWEEN THE TWO \
__  55 DTI 18,0¬/2,18¬/40,0¬/WILL BE PRESENTED.  \
__  56 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  57 PRR \
__  58 DE  0¬/32\
<H>IGH2
__   1 PR  \
__   2 DE  0¬/32\
__   3 DT  0,9¬/2,0¬/40,0¬/<SOME MORE HIGHLIGHTS >\
__   4 DT  4,0¬/2,4¬/40,0¬/<O>N COMPOSITE FALSE COLOR IMAGES LIKE \
__   5 DT  7,0¬/2,7¬/40,0¬/THOSE INCLUDED IN YOUR CURRICULUM KIT,\
__   6 DT  10,0¬/2,10¬/40,0¬/THE BLUISH-BLACK PORTIONS OF THE IMAGE\
__   7 DT  13,0¬/2,13¬/40,0¬/ARE WATER.\
__   8 DT  16,0¬/2,16¬/40,0¬/<T>HE BLACK SHOWN ON THIS IMAGE INDICATES \
__   9 DT  19,0¬/2,19¬/40,0¬/THE WATER IS CLEAR.\
__  10 DT  22,3¬/2,22¬/40,0¬/<T>HE BLUE INDICATES PARTICLES IN THE \
__  11 DT  25,0¬/2,25¬/40,0¬/WATER WHICH CAN RANGE FROM SEDIMENTATION\
__  12 DT  28,0¬/2,28¬/40,0¬/TO FORMS OF WATER POLLUTION.\
__  13 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  14 DE  0¬/32\
__  15 DT  0,0¬/2,0¬/40,0¬/<H>ELLO!!! <Y>OU HAVE JUST FINISHED THE \
__  16 DTI 3,0¬/2,3¬/40,0¬/SEGMENT ON INTERPRETATION TECHNIQUES.\
__  17 DTI 6,0¬/2,6¬/40,0¬/<H>OW ABOUT SOME MORE OPTIONS?
                          ?   ?.\
__  18 DT  16,3¬/2,16¬/40,0¬/¬A  <R>EVIEW THE SEGMENT JUST COMPLETED.\
__  19 DT  24,3¬/2,24¬/40,0¬/¬B <C>ONTINUE ON WITH THE NEXT SEGMENT\
__  20 PRR \
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<H>IGH2
    21 EPP ¬/SEG4A -065\
    22 NX  \
    23 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES\
    24 CAP 4,16,40,0¬/C0\
    25 BR  SEG4\
    26 CAP 4,24,40,0¬/C1\
    27 BR  QUIZ3\
    28 UN  U2\
    29 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES!\
QUIZ3
     1 PRR \
     2 DE  0¬/32\
     3 DT  0,0¬/2,0¬/40,0¬/<POINT TO THE ¬L¬E¬T¬T¬E¬R WHICH BEST ANSWERS
             >\
     4 DT  2,0¬/2,2¬/40,0¬/ <THE QUESTION>.\
     5 DT  5,2¬/2,5¬/40,0¬/1.  <O>N A COMPOSITE FALSE COLOR IMAGE \
     6 DTI 7,6¬/2,7¬/40,0¬/CLEAR WATER IS SHOWN AS:\
     7 DT  12,2¬/2,12¬/40,0¬/¬A.  <B>LUE\
     8 DT  15,2¬/2,15¬/40,0¬/¬B.  <B>LACK\
     9 DT  18,2¬/2,18¬/40,0¬/¬C.  <G>REEN\
    10 EPP ¬/QUIZ3 -010\
    11 NX  \
    12 DT  28,0¬/2,28¬/40,0¬/<T>RY AGAIN!!!\
    13 BR  RE\
    14 WAP 2,12,40,0¬/W0\
    15 DT  28,0¬/2,28¬/40,0¬/EH! <B>LUE IS THE 'NATURAL' COLOR!\
    16 DT  12,0¬/2,12¬/40,0¬/\
    17 WAP 2,18,40,0¬/W1\
    18 DT  28,0¬/2,28¬/40,0¬/<N>OPE! THAT IS NOT CORRECT\
    19 DT  18,0¬/2,18¬/40,0¬/\
    20 CAP 2,15,40,0¬/C2\
    21 DT  28,0¬/2,28¬/40,0¬/<G>REAT START!!!\
    22 UN  U3\
    23 DT  28,0¬/2,28¬/40,0¬/<C>ONCENTRATE.\
    24 BR  RE\
    25 PRR \
    26 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    27 DE  0¬/32\
    28 DT  5,2¬/2,5¬/40,0¬/2.  <T>HE COLOR <RED >ON A COMPOSITE FALSE \
    29 DT  7,2¬/2,7¬/40,0¬/COLOR IMAGE - INDICATES:\
    30 DT  10,2¬/2,10¬/40,0¬/¬A.  <S>TRESSED VEGETATION\
    31 DT  14,2¬/2,14¬/40,0¬/¬B.  <R>ED SOILS\
    32 DT  18,2¬/2,18¬/40,0¬/¬C.  <H>EALTHY VEGETATION\
    33 EPP ¬/QUIZ3 -033\
    34 NX  \
    35 DT  28,0¬/2,28¬/40,0¬/<U>SE THE LIGHT PEN AND TRY HARDER.\
    36 BR  RE\
    37 CAP 2,18,40,0¬/C0\
    38 DT  28,0¬/2,28¬/40,0¬/<Y>ES! <I>T REPRESENTS HEALTHY VEGETATION.\
    39 WAP 2,10,40,0¬/W1\
    40 DT  28,0¬/2,28¬/40,0¬/<C>LUE! <L>OTS OF CHLOROPHYL!!!!\
    41 DT  10,0¬/2,10¬/40,0¬/\
    42 WAP 2,14,40,0¬/W2\
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QUIZ3
__  43 DT  28,0¬/2,28¬/40,0¬/<C>ONDITION OF PLANTS IN BIOLOGICAL GARDEND
            \
__  44 DT  14,0¬/2,14¬/40,0¬/\
__  45 UN  U3\
__  46 DT  28,0¬/2,28¬/40,0¬/<Y>OU'RE LOOKING AT A FALSE COLOR IMAGE\
__  47 UN  U4\
__  48 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ¬C\
__  49 PRR \
__  50 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG4B
__   1 PRR \
__   2 DE  0¬/32\
__   3 DT  1,4¬/2,1¬/40,0¬/<APPLICATIONS OF REMOTE SENSING>\
__   4 DL  3,4¬/30\
__   5 DTI 4,0¬/2,4¬/40,0¬/<F>IVE AREAS WHERE REMOTE SENSING IS BEING\
__   6 DTI 6,0¬/2,6¬/40,0¬/APPLIED IN <C>ANADA ARE:\
__   7 DT  8,2¬/2,8¬/40,0¬/1.  <A>GRICULTURE   4. <H>YDROLOGY \
__   8 DT  10,2¬/2,10¬/40,0¬/2.  <G>EOLOGY       5. <M>ETEOROLOGY\
__   9 DT  12,2¬/2,12¬/40,0¬/3.  <F>ORESTRY. \
__  10 DT  17,0¬/2,17¬/40,0¬/<F>OR EXAMPLE, IN ¬F¬O¬R¬E¬S¬T¬R¬Y, <R>EMOT
             E \
__  11 DT  19,0¬/2,19¬/40,0¬/<S>ENSING IS ABLE TO TELL FORESTERS \
__  12 DT  21,0¬/2,21¬/40,0¬/ABOUT THE TYPE AND EXTENT OF DAMAGE \
__  13 DT  23,0¬/2,23¬/40,0¬/TO TREES BEING DONE TO THEM BY DISEASE,\
__  14 DT  25,0¬/2,25¬/40,0¬/AND BY POLLUTION.\
__  15 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  16 PRR \
SEG4C
__   1 DE  0¬/32\
__   2 DT  0,0¬/2,0¬/40,0¬/<P>OINT TO THE WORD OR WORDS WHICH ARE \
__   3 DT  2,0¬/2,2¬/40,0¬/APPLICATIONS OF <R>EMOTE <S>ENSING.\
__   4 DT  6,0¬/2,6¬/40,0¬/¬A.  <A>GRICULTURE\
__   5 DT  10,0¬/2,10¬/40,0¬/¬B.  <H>YDROLOGY\
__   6 DT  14,0¬/2,14¬/40,0¬/¬C.  <G>EOLOGY\
__   7 DT  20,0¬/2,20¬/40,0¬/¬D.  <F>ORESTRY\
__   8 DT  24,0¬/2,24¬/40,0¬/¬E.  <A>LL OF THE ABOVE.\
__   9 DT  27,0¬/2,27¬/40,0¬/¬F.  <N>ONE OF THE ABOVE.\
__  10 EPP ¬/SEG4C -010\
__  11 NX  \
__  12 DT  29,0¬/2,29¬/40,0¬/<P>LEASE <H>URRY!\
__  13 DT  29,0¬/2,29¬/40,0¬/<T>RY AGAIN!\
__  14 CAP 2,24,40,0¬/C0\
__  15 DT  29,0¬/2,29¬/40,0¬/<T>HAT'S CORRECT ! <A>LL ARE APPLICATIONS.\
__  16 WAP 2,6,40,0¬/W1\
__  17 DT  29,0¬/2,29¬/40,0¬/<Y>ES - BUT THERE ARE OTHERS\
__  18 WAP 2,10,40,0¬/W2\
__  19 DT  29,0¬/2,29¬/40,0¬/<Y>ES - <B>UT THERE ARE SOME MORE\
__  20 WAP 2,14,40,0¬/W3\
__  21 DT  29,0¬/2,29¬/40,0¬/<Y>ES - <B>UT THERE ARE OTHERS\
__  22 WAP 2,20,40,0¬/W4\
__  23 WAP 2,6,40,0¬/W5\
__  24 CAP 2,22,40,0¬/C6\
__  25 DT  29,0¬/2,29¬/40,0¬/<R>IGHT ON! THEY ARE ALL APPLICATIONS \
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SEG4C
__  26 WAP 2,24,40.0¬/W7\
__  27 DT  29,0¬/2,29¬/40,0¬/<B>00 <H>ISS!!! <T>0 <Y>OU\
__  28 UN  U8\
__  29 DT  29,0¬/2,29¬/40,0¬/<Y>OUR GUESSING <T>RY<A>GAIN\
__  30 NO  COPY¬/DRWMEV-2¬,DRWMEV-17¬,SDRAW-5\
__  31 CM  DRWMEV¬/0¬,0\
__  47 NO  EM\
__  48 BR  RE\
__  49 PRR \
__  50 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG5
__   1 PRR \
__   2 DE  0¬/32\
__   3 DT  4,0¬/2,4¬/40,0¬/<LANDSAT IMAGERY INTERPRETATION >\
__   4 DT  7,0¬/2,7¬/40,0¬/<F>OR THIS SEGMENT, YOU WILL REQUIRE THE \
__   5 DT  9,0¬/2,9¬/40,0¬/FOLLOWING ITEMS:\
__   6 DT  13,4¬/2,13¬/40,0¬/1.  <C A I L>ANDSAT <C>URRICULUM <K>IT\
__   7 DT  16,4¬/2,16¬/40,0¬/2.  <M>AGNIFYING GLASS\
__   8 DT  19,4¬/2,19¬/40,0¬/3.  <P>ATIENCE\
__   9 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  10 DE  0¬/32\
__  11 NO  COPY¬/DRWBCX-2¬,DRWBCX-23¬,SDRAW-6\
__  12 CM  DRWBCX¬/0¬,0\
__  34 NO  EM\
__  35 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  36 DE  0¬/32\
__  37 DTI 3,2¬/2,3¬/40,0¬/<T>HE <C A I >CURRICULUM KIT CONTAINS THE \
__  38 DT  5,0¬/2,5¬/40,0¬/FOLLOWING ITEMS:\
__  39 DT  8,4¬/2,8¬/40,0¬/1.  <A >COMPOSITE FALSE COLOR IMAGE OF \
__  40 DT  10,4¬/2,10¬/40,0¬/     <W>INNIPEG (<A>UGUST 1976)\
__  41 DT  14,4¬/2,14¬/40,0¬/2.  <A >COMPOSITE FALSE COLOR IMAGE OF \
__  42 DTI 16,8¬/2,16¬/40,0¬/<W>INNIPEG (<D>ECEMBER 1975).  \
__  43 DT  20,4¬/2,20¬/40,0¬/3.  <A >ROAD MAP OF <W>INNIPEG \
__  44 DT  24,4¬/2,24¬/40,0¬/4.  <A >TRANSPARENT <G>RID\
__  45 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  46 DE  0¬/32\
__  47 DTI 0,2¬/2,0¬/38,2¬/<W>OULD YOU PLEASE OPEN YOUR CURRICULUM \
__  48 DT  2,0¬/2,2¬/40,0¬/KIT TO PAGE TWO AND PLACE THE TRANS-\
__  49 DT  4,0¬/2,4¬/40,0¬/PARENT <G>RID ON THE <W>INNIPEG (<A>UGUST)\
__  50 DT  6,0¬/2,6¬/40,0¬/MAP.\
__  51 DTI 9,2¬/2,9¬/38,2¬/<B>E SURE THAT THE <G>RID IS ALINED \
__  52 DT  11,0¬/2,11¬/40,0¬/CORRECTLY.  <N>UMBER 1 SHOULD APPEAR IN \
__  53 DT  13,0¬/2,13¬/40,0¬/THE UPPER LEFT HAND CORNER.\
__  54 DTI 16,2¬/2,16¬/38,2¬/<L>ATER, YOU WILL BE ASKED TO MOVE THE \
__  55 DT  18,0¬/2,18¬/40,0¬/GRID TO THE <W>INNIPEG (<D>ECEMBER) IMAGE \
__  56 DT  20,0¬/2,20¬/40,0¬/FOLLOWING THE SAME PROCEDURE OUTLINED \
__  57 DT  22,0¬/2,22¬/40,0¬/ABOVE.\
__  58 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  59 DE  0¬/32\
__  60 DT  0,4¬/2,0¬/40,0¬/<LANDSAT IMAGERY INTERPRETATION >\
__  61 DT  3,0¬/2,3¬/40,0¬/<Y>OU WILL BE ASKED A SERIES OF QUESTIONS\
__  62 DT  5,0¬/2,5¬/40,0¬/TO WHICH YOU MAY RESPOND USING THE \
__  63 DT  7,0¬/2,7¬/40,0¬/KEYBOARD OR LIGHTPEN RESPECTIVELY.\
```

```
SEG5
__   64 DT  10,0¬/2,10¬/40,0¬/<P>LEASE PAY CLOSE ATTENTION TO WHAT IS \
__   65 DT  12,0¬/2,12¬/40,0¬/BEING ASKED, AND THINK THROUGH YOUR \
__   66 DT  14,0¬/2,14¬/40,0¬/ANSWER CAREFULLY BEFORE REPLYING.\
__   67 DT  17,0¬/2,17¬/40,0¬/<S>HOULD YOU NEED ASSISTANCE, YOU WILL\
__   68 DT  19,0¬/2,19¬/40,0¬/RECEIVE SOME REMEDIAL INSTRUCTION OR\
__   69 DT  21,0¬/2,21¬/40,0¬/IF YOU ARE STILL BAFFLED, YOU CAN REFER \
__   70 DT  23,0¬/2,23¬/40,0¬/TO THE <W>INNIPEG ROAD MAP.  \
__   71 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   72 DE  0¬/32\
__   73 DTI 11,11¬/2,11¬/40,0¬/<BONNE CHANCE>!!!\
__   74 DT  15,11¬/2,15¬/40,0¬/<GOOD LUCK>!!!\
__   75 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4
__    1 PRR \
__    2 DE  0¬/32\
__    3 DT  2,0¬/2,2¬/40,0¬/<L>ETS START WITH AN EASY QUESTION TO \
__    4 DT  4,0¬/2,4¬/40,0¬/GET YOU ORIENTED.
                 \
__    5 DT  8,12¬/2,8¬/40,0¬/<QUESTION NO>. 1\
__    6 DT  14,0¬/2,14¬/40,0¬/<T>HE CITY OF <W>INNIPEG IS LOCATED WITHIN
           \
__    7 DT  16,0¬/2,16¬/40,0¬/WHAT GRID NUMBER ON THE IMAGE? \
__    8 DT  19,0¬/2,19¬/40,0¬/<U>SE A ONE OR TWO DIGIT NUMBER ¬O¬N¬L¬Y IN
             \
__    9 DT  21,0¬/2,21¬/40,0¬/YOUR ANSWER.\
__   10 LD  <G>RID 8 1 2 3 4 5 6 7 9 12 ¬/B1\
__   11 EP  24,2¬/2,24¬/40,0¬/600¬/99¬/QUIZ4 -C11\
__   12 NX  \
__   13 DE  0¬/32\
__   14 NO  COPY¬/DRWATP-2¬,DRWATP-45¬,SDRAW-4\
__   15 CM  DRWATP¬/0¬,0\
__   53 NO  EM\
__   54 DT  28,0¬/2,28¬/40,0¬/<C>OME ON! <I >SAID IT WAS EASY.\
__   55 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   56 BR  QUIZ4\
__   57 FN2 COD¬/1,1\
__   58 FN2 SQ¬/CO¬/('2)\
__   59 DT  28,0¬/2,28¬/40,0¬/<Y>OU'RE ON YOUR WAY!\
__   60 FN2 SQ¬/W1¬/(3+4+5+6+7+8+9+10)\
__   61 DT  28,0¬/2,28¬/40,0¬/<T>HE CITY HAS AN AQUA/BLUE COLOR.\
__   62 UN  U2\
__   63 DT  28,0¬/2,28¬/40,0¬/<S>CAN GRIDS 6 TO 10\
__   64 UN  U3\
__   65 DT  28,0¬/2,28¬/40,0¬/<T>YPE 8\
__   66 PRR \
__   67 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4A
__    1 DE  0¬/32\
__    2 DT  6,12¬/2,6¬/40,0¬/<QUESTION NO>. 2. \
__    3 DT  12,0¬/2,12¬/40,0¬/<W>HAT DO THE STRAIGHT LINES ON THE ¬I¬M¬A¬
            G¬E \
__    4 DT  14,0¬/2,14¬/40,0¬/COVERED BY <G>RIDS 1 AND 2 INDICATE?\
__    5 LD  ROADS RAILWAYS RAILROADS HIGHWAYS ROAD RAILWAY BOUNDARIES¬/B1
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                \
     6 EP  20,2¬/2,20¬/40,0¬/600¬/99¬/QUIZ4A-006\
     7 NX  \
     8 DT  28,0¬/2,28¬/40,0¬/<L>OOK CLOSELY AT <G>RID 2 \
     9 BR  RE\
    10 FN2 COD¬/1,1\
    11 FN2 SQ¬/CO¬/(1+2+3+4+5+6)\
    12 DT  28,0¬/2,28¬/40,0¬/<Y>ES ROADS AND RAILROADS .\
    13 FN2 SQ¬/W1¬/(7)'\
    14 DT  28,0¬/2,28¬/40,0¬/<T>HINK ABOUT TRANSPORTATION\
    15 UN  U2\
    16 DT  28,0¬/2,28¬/40,0¬/<H>INT! <A >TRANSPORTATION CULTURAL FEATURE
                \
    17 UN  U3\
    18 DT  28,0¬/2,28¬/40,0¬/<T>YPE ROAD  OR RAILROADS\
    19 PRR \
    20 DE  0¬/32\
    21 NO  COPY¬/DRWOBG-2¬,DRWOBG-19¬,SDRAW-1\
    22 CM  DRWOBG¬/0¬,0\
    40 NO  EM\
    41 FN  XP¬/4¬/16¬/7¬/<WOW>!\
    42 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4B
     1 DE  0¬/32\
     2 DE  0¬/32\
     3 DT  4,12¬/2,4¬/40,0¬/<QUESTION NO>. 3\
     4 DL  6,12¬/14\
     5 DT  10,0¬/2,10¬/40,0¬/<W>HAT DOES THE LARGE BLACK AREA IN \
     6 DT  12,0¬/2,12¬/40,0¬/<G>RID 3 INDICATE?\
     7 DTI 16,0¬/2,16¬/40,0¬/<P>LEASE USE A ¬0¬N¬E WORD ANSWER.\
     8 LD  WATER LAKE SWAMP LAKE <W>INNIPEG LAKE <M>ANITOBA¬/B1\
     9 EP  19,2¬/2,19¬/40,0¬/600¬/99¬/QUIZ4B-009\
    10 NX  \
    11 DT  28,0¬/2,28¬/40,0¬/<T>HINK IN TERMS OF COMPOSITE FALSE COLORS\
    12 BR  RE\
    13 FN2 COD¬/1,1\
    14 FN2 SQ¬/CO¬/(1+2)\
    15 DT  28,0¬/2,28¬/40,0¬/<G>REAT! <Y>OUR'RE DOING JUST FINE.\
    16 FN2 SQ¬/W1¬/(3+4+5+6+7)\
    17 DT  28,0¬/2,28¬/40,0¬/<H>AVE A PEAK AT THE ROAD MAP!\
    18 UN  U2\
    19 DT  28,0¬/2,28¬/40,0¬/<W>ATER APPEARS BLACK OR BLUE \
    20 UN  U3\
    21 DT  28,0¬/2,28¬/40,0¬/TYPE WATER\
    22 PRR \
    23 DE  0¬/32\
    24 NO  COPY¬/DRWAEL-2¬,DRWAEL-11¬,SDRAW-3\
    25 CM  DRWAEL¬/0¬,0\
    35 NO  EM\
    36 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4C
     1 DE  0¬/32\
     2 DT  10,12¬/2,10¬/40,0¬/<QUESTION NO>. 5\
     3 DL  12,12¬/14\
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QUIZ4C
     4 DT  16,0¬/2,16¬/40,0¬/<W>HAT ARE THE LITTLE RECTANGLES AROUND\
     5 DT  18,0¬/2,18¬/40,0¬/THE CITY OF <W>INNIPEG?\
     6 DT  20,0¬/2,20¬/40,0¬/<P>LEASE USE A ¬0¬N¬E WORD ANSWER.\
     7 LD  FARM FIELD CROPS FARM LAND PLOTS¬/B1\
     8 EP  24,2¬/2,24¬/40,0¬/600¬/99¬/QUIZ4C-008\
     9 NX  \
    10 DT  28,0¬/2,28¬/40,0¬/<T>HINK ABOUT WHERE PRODUCE IS GROWN.\
    11 BR  RE\
    12 FN2 COD¬/1,1\
    13 FN2 SQ¬/CO¬/(1+2+3+(4.5))\
    14 DT  28,0¬/2,28¬/40,0¬/<B>INGO! <F>ARMLAND WITH ALL TYPES OF CROPS
            \
    15 FN2 SQ¬/W1¬/(6)\
    16 DT  28,0¬/2,28¬/40,0¬/<H>INT! <C>ROPS ARE GROWN ON?\
    17 UN  U2\
    18 DT  28,0¬/2,28¬/40,0¬/<H>INT! <W>HERE VEGETABLES ARE GROWN.\
    19 UN  U3\
    20 DT  28,0¬/2,28¬/40,0¬/<T>YPE FARMLAND\
    21 PRR \
    22 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4D
     1 PRR \
     2 DE  0¬/32\
     3 DT  6,12¬/2,6¬/40,0¬/<QUESTION NO>. 6\
     4 DL  8,12¬/14\
     5 DT  12,0¬/2,12¬/40,0¬/<W>HAT DOES THE REDNESS IN THE SOUTH ENDS \
     6 DT  14,0¬/2,14¬/40,0¬/OF <L>AKES <M>ANITOBA AND <W>INNIPEG \
     7 DT  16,0¬/2,16¬/40,0¬/INDICATE?\
     8 LD  MARSH MARSHES MARSHLAND VEGETATION WEEDS SWAMP¬/B1\
     9 EP  20,2¬/2,20¬/40,0¬/600¬/99¬/QUIZ4D-009\
    10 NX  \
    11 DT  28,0¬/2,28¬/40,0¬/<L>OOK AT <G>RIDS 1 AND 3\
    12 BR  RE\
    13 FN2 COD¬/1,1\
    14 FN2 SQ¬/CO¬/(1+2+3+4)\
    15 DT  28,0¬/2,28¬/40,0¬/<Y>ES <M>ARSHES OR MARSHLAND\
    16 FN2 SQ¬/W1¬/(4+5+6)\
    17 DT  28,0¬/2,28¬/40,0¬/<H>INT! <R>ED INDICATES A TYPE OF VEGETATIO
            N\
    18 UN  U2\
    19 DT  28,0¬/2,28¬/40,0¬/<Y>OU NORMALLY FIND THIS NEAR A LAKES END\
    20 UN  U3\
    21 DT  28,0¬/2,28¬/40,0¬/TYPE MARSHLAND\
    22 PRR \
    23 DE  0¬/32\
    24 NO  COPY¬/DRW2DG-2¬,DRW2DG-19¬,SDRAW-1\
    25 CM  DRW2DG¬/0¬,0\
    43 NO  EM\
    44 FN  XP¬/2¬/16¬/3¬/<RIGHT ON TARGET>!\
    45 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    46 DE  0¬/32\
QUIZ4E
     1 DE  0¬/32\
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QUIZ4E
     2 DT  8,14¬/2,8¬/40,0¬/<QUESTION NO>. 8\
     3 DL  10,14¬/14\
     4 DT  14,0¬/2,14¬/40,0¬/<W>HAT DO THE PATCHES OF WHITE ALONG \
     5 DT  16,0¬/2,16¬/40,0¬/THE <W>INNIPEG <R>IVER INDICATE?\
     6 LD  FOREST CLEARING CUT FOREST LUMBERING WOOD CUTTING CLEARED LAN
            D BARE SOIL NO CROP SUMER FALOW¬/B1\
     7 EP  22,2¬/2,22¬/40,0¬/600¬/99¬/QUIZ4E-007\
     8 NX  \
     9 DT  28,0¬/2,28¬/40,0¬/<L>OOK AGAIN!\
    10 FN2 COD¬/1,1\
    11 FN2 SQ¬/CO¬/(1.2)+(3.4)+5(6.7)+(8.9)+(10.11))\
    12 DT  28,0¬/2,28¬/40,0¬/<Y>ES! <E>VIDENCE OF FOREST CLEARING.\
    13 FN2 SQ¬/W1¬/(12.13)+(14.15)\
    14 DT  28,0¬/2,28¬/40,0¬/<H>OUSES ARE A BYPRODUCT OF THIS INDUSTRY!\
    15 UN  U2\
    16 DT  28,0¬/2,28¬/40,0¬/<H>OUSES ARE A BYPRODUCT OF THIS INDUSTRY!\
    17 UN  U3\
    18 DT  28,0¬/2,28¬/40,0¬/<T>YPE FOREST CLEARING \
    19 PRR \
    20 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4F
     1 DE  0¬/32\
     2 DT  0,12¬/2,0¬/40,0¬/<QUESTION NO>. 9\
     3 DL  2,12¬/14\
     4 DT  6,0¬/2,6¬/40,0¬/<L>ANDLOTS ALONG THE <R>ED AND <A>SSINIBOINE
            \
     5 DT  8,0¬/2,8¬/40,0¬/<R>IVERS ARE LAID OUT IN PARALLEL \
     6 DT  10,0¬/2,10¬/40,0¬/RECTANGLES FRONTING ON THE <R>IVERS.\
     7 DT  18,2¬/2,18¬/40,0¬/¬T\
     8 DT  23,2¬/2,23¬/40,0¬/¬F\
     9 EPP ¬/QUIZ4F-009\
    10 NX  \
    11 DT  28,0¬/2,28¬/40,0¬/<P>LEASE WORK FASTER\
    12 DT  26,0¬/2,26¬/40,0¬/<T>RY AGAIN!\
    13 BR  RE\
    14 CAP 4,18,3,0¬/CO\
    15 DTI 28,0¬/2,28¬/40,0¬/<Y>ES! <P>ARALLEL RECTANGLES.\
    16 WAP 4,23,3,0¬/W1\
    17 DT  28,0¬/2,28¬/40,0¬/<T>HINK OF THE SEIGNEURAL SYSTEM\
    18 UN  U2\
    19 DTI 28,0¬/2,28¬/40,0¬/<C>LUE! <F>RENCH LONG LOT SYSTEM!\
    20 UN  U3\
    21 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO *¬T \
    22 BR  RE\
    23 PRR \
    24 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ4G
     1 DE  0¬/32\
     2 DT  12,12¬/2,12¬/40,0¬/<QUESTION NO>. 10\
     3 DL  14,12¬/14\
     4 DT  16,0¬/2,16¬/40,0¬/<I>N <G>RID 7 YOU CAN SEE SOME BLACK \
     5 DT  18,0¬/2,18¬/40,0¬/RECTANGLES.  <W>HAT ARE THEY EVIDENCE OF?\
     6 LD  FALLOW BARE SOIL NO CROPS SUMMER FALLOW¬/B1\
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QUIZ4G
__    7 EPI 24,2¬/2,24¬/40,0¬/600¬/99¬/QUIZ4G-007\
__    8 NX  \
__    9 DT  28,0¬/2,28¬/40,0¬/<Y>OU RAN OUT OF TIME\
__   10 FN2 COD¬/1,1\
__   11 FN2 SQ¬/CO¬/(1+(2.3)+(4.5)+(6.7))¬/B1\
__   12 DT  28,0¬/2,28¬/40,0¬/<Y>ES! BARE SOIL OR SUMMER FALLOW\
__   13 FN2 SQ¬/W1¬/(8+9)\
__   14 DT  28,0¬/2,28¬/40,0¬/<B>LACK RECTANGLES INDICATE NO CROPS\
__   15 UN  U2\
__   16 DT  28,0¬/2,28¬/40,0¬/<B>LACK RECTANGLES%%%%%%%%%%_________ %_ CA
          NNOT INDICATE WATER.\
__   17 UN  U3\
__   18 DT  28,0¬/2,28¬/40,0¬/<T>YPE BARE SOIL\
__   19 PRR \
__   20 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG6
__    1 PRR \
__    2 DE  0¬/32\
__    3 DE  0¬/32\
__    4 DT  0,2¬/2,0¬/40,0¬/<N>OW THAT YOU HAVE HAD A CHANCE TO LOOK\
__    5 DT  2,0¬/2,2¬/40,0¬/AT THE <W>INNIPEG IMAGE, HERE ARE SOME\
__    6 DT  4,0¬/2,4¬/40,0¬/ADDITIONAL THINGS YOU CAN LOOK FOR.\
__    7 DTI 9,2¬/2,9¬/40,0¬/<A>S YOU CAN SEE, THE CITY IS ALMOST \
__    8 DTI 11,0¬/2,11¬/40,0¬/CENTERED AT THE RIVER JUNCTIONS. <T>HE \
__    9 DTI 13,0¬/2,13¬/40,0¬/COLORS IN THE FIELDS AROUND THE CITY \
__   10 DTI 15,0¬/2,15¬/40,0¬/INDICATE THE FOLLOWING:\
__   11 DT  19,2¬/2,19¬/40,0¬/<R>ED - <F>ULL STANDING CROPS.  <G>REEN \
__   12 DT  21,2¬/2,21¬/40,0¬/CHLOROPHYL SHOWS AS RED IN THESE IMAGES.\
__   13 DT  23,2¬/2,23¬/40,0¬/<Y>ELLOW - INDICATES MATURED CROPS READY \
__   14 DT  25,2¬/2,25¬/40,0¬/FOR HARVESING, AND PALE RED INDICATES \
__   15 DT  27,2¬/2,27¬/40,0¬/THE HARVEST IS UNDER WAY.\
__   16 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   17 DE  0¬/32\
__   18 DT  0,0¬/2,0¬/40,0¬/<W>HITE PATCHES THAT APPEAR LARGER THAN \
__   19 DT  2,0¬/2,2¬/40,0¬/OTHER FIELDS, APPROXIMATELY 1.6MM.\
__   20 DT  4,0¬/2,4¬/40,0¬/ARE THE SIZE OF A SECTION OF LAND.\
__   21 DT  6,0¬/2,6¬/40,0¬/AND ARE PASTURES.\
__   22 DT  9,0¬/2,9¬/40,0¬/<T>HE BLUISH  - BLACK PORTIONS OF THE \
__   23 DT  11,0¬/2,11¬/40,0¬/IMAGE ARE WATER.  <T>HE BLUE INDICATES \
__   24 DT  13,0¬/2,13¬/40,0¬/PARTICLES IN THE WATER WHICH CAN RANGE \
__   25 DT  15,0¬/2,15¬/40,0¬/FROM SEDIMENTATION TO FORMS OF WATER \
__   26 DT  17,0¬/2,17¬/40,0¬/POLLUTION.\
__   27 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
BRAN3
__    1 PRR \
__    2 DE  0¬/32\
__    3 DT  0.0¬/2,0¬/40,0¬/<I>T TAKES A LITTLE PRACTICE BEFORE YOU \
__    4 DT  3,0¬/2,3¬/40,0¬/CAN READILY PICK OUT KEY FEATURES ON A \
__    5 DT  6,0¬/2,6¬/40,0¬/<L>ANDSAT IMAGE.  <S>OMETIMES A LITTLE \
__    6 DT  9,0¬/2,9¬/40,0¬/IS NEEDED.  <B>Y IDENTIFYING KEY FEATURES \
__    7 DT  12,0¬/2,12¬/40,0¬/ON EACH IMAGE THAT YOU CAN LOOK FOR, WE\
__    8 DT  16;0¬/2,16¬/40,0¬/HOPE IT MAKES THE TASK OF INTERPRET-\
__    9 DT  19,0¬/2,19¬/40,0¬/ATION EASIER.  <I>N ORDER TO BRING THIS \
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BRAN3
    10 DT  22,0¬/2,22¬/40,0¬/POINT HOME,HOW ABOUT ANOTHER OF OUR \
    11 DT  25,0¬/2,25¬/40,0¬/OPTIONS?\
    12 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    13 DE  0¬/32\
    14 DT  4,0¬/2,4¬/40,0¬/<P>LEASE PDINT TO YOUR CHOICE WITH THE \
    15 DT  7,0¬/2,7¬/40,0¬/LIGHTPEN.\
    16 DT  16,3¬/2,16¬/40,0¬/¬A  <R>EPEAT THIS SECTIDN.  \
    17 DT  24,3¬/2,24¬/40,0¬/¬B  <I >WANT TO CONTINUE.  \
    18 EPP ¬/BRAN3 -018\
    19 NX  \
    20 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES\
    21 CAP 4,16,40,0¬/C0\
    22 BR  SEG6\
    23 CAP 4,24,40,0¬/C1\
    24 BR  QUIZ5\
    25 UN  U2\
    26 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO DNE OF THE CHOICES.\
QUIZ5
     1 DE  0¬/32\
     2 DT  0,0¬/2,0¬/40,0¬/<PLEASE PLACE THE TRANSPARENT GRID ON >\
     3 DT  2,0¬/2,2¬/40,0¬/<PAGE >3 (<THE WINNIPEG DECEMBER>) <MAP>\
     4 DT  4,0¬/2,4¬/40,0¬/<N>UMBER 1 SHOULD APPEAR IN THE TOP LEFT   \
     5 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
     6 DE  0¬/32\
     7 DT  8,0¬/2,8¬/40,0¬/<W>HEN A MAJDR PORTIDN DF A <L>ANDSAT \
     8 DT  11,0¬/2,11¬/40,0¬/BAND 8 INFRA-RED FALSE CDLDR IMAGE \
     9 DT  14,0¬/2,14¬/40,0¬/IS DEVDID OF GREEN VEGETATIDN, IT CAN \
    10 DT  17,0¬/2,17¬/40,0¬/HAVE A BLUISH TINGE.  <I>T IS NDTICEABLE \
    11 DT  20,0¬/2,20¬/40,0¬/ON THIS WINTER IMAGE.  \
    12 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    13 DE  0¬/32\
    14 DT  10,12¬/2,10¬/40,0¬/<QUESTIDN ND>. 1 \
    15 DL  12,12¬/14\
    16 DT  16,0¬/2,16¬/40,0¬/<I>N WHAT DIRECTIONS%%%%%%%%%%_____ AR
            E THE <G>LACIAL \
    17 DT  18,0¬/2,18¬/40,0¬/STRIATIONS(ICE SCRATCHES)ORIENTED?\
    18 LD  NORTH SDUTH N S NDRTH TO SOUTH EAST WEST E W¬/B1\
    19 EP  23,2¬/2,23¬/40,0¬/600¬/99¬/QUIZ5 -019\
    20 NX  \
    21 DT  28,0¬/2,28¬/40,0¬/<L>DDK AT <G>RID 2 GOING SOUTH\
    22 BR  RE\
    23 FN2 COD¬/1,1\
    24 FN2 SQ¬/C3¬/((1,2)+(3,4)+(5,6,7))\
    25 DT  28,0¬/2,28¬/40,0¬/<Y>ES! THEY RUN IN A NORTH SDUTH DIRECTION\
    26 FN2 SQ¬/W4¬/(8+9)\
    27 DTI 28,0¬/2,28¬/40,0¬/<L>ODK CLDSELY!\
    28 UN  U5\
    29 DT  28,0¬/2,28¬/40,0¬/<T>RY ANDTHER DIRECTION!!!!\
    30 UN  U6\
    31 DT  28,0¬/2,28¬/40,0¬/TYPE NDRTH SOUTH\
    32 PRR \
    33 DE  0¬/32\
    34 NO  COPY¬/DRWOTX-2¬,DRWOTX-23¬,SDRAW-1\
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QUIZ5
    35 CM  DRWOTX¬/O¬,O\
    57 NO  EM\
    58 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    59 PRR \
QUIZ5A
     1 DE  O¬/32\
     2 DT  6,12¬/2,6¬/40,O¬/<QUESTION NO>. 2\
     3 DL  8,12¬/14\
     4 DT  11,O¬/2,11¬/40,O¬/<N>AME ONE <G>RID THAT SHOWS EVIDENCE OF \
     5 DT  13,O¬/2,13¬/40,O¬/OPEN WATER AND FROZEN WATER.\
     6 LD  <G>RID 3 1 2 4 5 6 7 8 9 13¬/B1\
     7 EP  18,2¬/2,18¬/40,O¬/600¬/99¬/QUIZ5A-007\
     8 NX  \
     9 DTI 28,O¬/2,28¬/40,O¬/SLOW POKE! <T>RY AND RESPOND FASTER!\
    10 FN2 COD¬/1,1\
    11 FN2 SQ¬/CO¬/('2)\
    12 DT  28,O¬/2,28¬/40,O¬/<Y>ES! <L>AKE <W>INNIPEG HAS BOTH.\
    13 FN2 SQ¬/W1¬/(3+4+5+6+7+8+9+10+11)\
    14 DTI 28,O¬/2,28¬/40,O¬/<L>OOK CLOSELY AT THE TWO BIG LAKES.\
    15 UN  U2\
    16 DT  28,O¬/2,28¬/40,O¬/WATER APPEARS BLACK\
    17 UN  U3\
    18 DT  28,O¬/2,28¬/40,O¬/<T>YPE 3\
    19 PRR \
    20 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ5B
     1 DE  O¬/32\
     2 DT  8,12¬/2,8¬/40,O¬/<QUESTION NO>. 3\
     3 DL  10,12¬/14\
     4 DT  13,O¬/2,13¬/40,O¬/<G>RIDS 5 10 AND 15 APPEAR PREDOMINATELY \
     5 DT  15,O¬/2,15¬/40,O¬/<RED >IN COLOR.  <W>HAT IS THIS EVIDENCE OF
            ?\
     6 LD  CONIFER CONIFEROUS DECIDUOUS TREE VEGETATION¬/B1\
     7 EP  24,2¬/2,24¬/40,O¬/600¬/99¬/QUIZ5B-007\
     8 NX  \
     9 DT  28,O¬/2,28¬/40,O¬/<H>URRAY PLEASE!\
    10 BR  RE\
    11 FN2 COD¬/1,1\
    12 FN2 SQ¬/CO¬/(1+2+3+4+(2,4)+(3,4))\
    13 DT  28,O¬/2,28¬/40,O¬/<E>XACTLY CONIFERS AND DECIDUOUS TREES.\
    14 FN2 SQ¬/W1¬/(5)\
    15 DTI 28,O¬/2,28¬/40,O¬/<I >AM LOOKING FOR A TYPE OF TREE\
    16 UN  U2\
    17 DT  28,O¬/2,28¬/40,O¬/<T>HERE ARE TWO MAIN TYPES OF TREES\
    18 UN  U3\
    19 DTI 28,O¬/2,28¬/40,O¬/<T>YPE CONIFERS\
    20 PRR \
    21 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
QUIZ5C
     1 DE  O¬/32\
     2 DT  4,12¬/2,4¬/40,O¬/<QUESTION NO>. 4\
     3 DL  6,12¬/14\
     4 DT  10,O¬/2,10¬/40,O¬/<T>HIS <L>ANDSAT INFRARED FALSE COLOR IMAGE
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                \
    5 DT  12,0¬/2,12¬/40,0¬/HAS A BLUISH TINGE BECAUSE IT IS \
    6 DT  14,0¬/2,14¬/40,0¬/PARTIALLY DEVOID OF VEGETATION.  \
    7 DT  16,0¬/2,16¬/40,0¬/POINT TO ¬T OR ¬F \
    8 DTI 20,2¬/2,20¬/40,0¬/¬T\
    9 DT  24,2¬/2,24¬/40,0¬/¬F\
   10 EPP ¬/QUIZ5C-010\
   11 NX  \
   12 DTI 28,0¬/2,28¬/40,0¬/<Y>OU TIMED OUT\
   13 BR  RE\
   14 CAP 4,18,40,0¬/CO\
   15 DT  28,0¬/2,28¬/40,0¬/<Y>ES! <T>HERE IS ALMOST NO VEGETATION.\
   16 PAE \
   17 WAP 24,2,40,0¬/W1\
   18 DT  28,0¬/2,28¬/40,0¬/<H>INT! <L>OOK FOR LOSS OF CHLOROPHYL.\
   19 UN  U2\
   20 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ¬T OR ¬F\
   21 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG7
    1 DE  0¬/32\
    2 DT  0,2¬/2,0¬/40,0¬/<Y>OU PROBABLY HAVE NOTICED SIGNIFICANT \
    3 DTI 3,0¬/2,3¬/40,0¬/DIFFERENCES BETWEEN THE <W>INNIPEG \
    4 DTI 6,0¬/2,6¬/40,0¬/SUMMER AND WINTER IMAGES BEYOND WHAT \
    5 DTI 9,0¬/2,9¬/40,0¬/YOU HAVE BEEN QUIZZED ON.  <I>F YOU HAVE,\
    6 DTI 12,0¬/2,12¬/40,0¬/YOU'RE ALREADY ON YOUR WAY TO BECOMING\
    7 DTI 15,0¬/2,15¬/40,0¬/AN EXPERT IN <L>ANDSAT IMAGE INTERPRET-\
    8 DTI 18,0¬/2,18¬/40,0¬/ATION.\
    9 DTI 22,3¬/2,22¬/40,0¬/<H>ERE ARE SOME ADDITIONAL THINGS THAT \
   10 DT  25,0¬/2,25¬/40,0¬/YOU CAN EXAMINE ON THE <W>INNIPEG \
   11 DT  28,0¬/2,28¬/40,0¬/(<D>ECEMBER) IMAGE. \
   12 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
   13 DE  0¬/32\
   14 DTI 6,2¬/2,6¬/40,0¬/1. <T>HE LAKE BED AND SHORES OF PLIEST-\
   15 DTI 9,0¬/2,9¬/40,0¬/OCENE AGE <L>AKE <A>GASSIZ IS NOTICEABLE. \
   16 DTI 12,0¬/2,12¬/40,0¬/<W>INNIPEG IS IN THE MIDDLE OF THIS \
   17 DTI 15,0¬/2,15¬/40,0¬/ANCIENT LAKE BED.  \
   18 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
   19 PRR \
   20 DE  0¬/32\
   21 DTI 0,0¬/2,0¬/40,0¬/2. <I>N THE SOUTH OF THE CITY OF <W>INNIPEG\
   22 DTI 3,3¬/2,3¬/37,3¬/THE DARK RED PATCHES ARE PARKLAND.  \
   23 DTI 6,0¬/2,6¬/40,0¬/3. <G>LACIAL STRIATION IS VERY NOTICEABLE.\
   24 DTI 9,0¬/2,9¬/40,0¬/4. <A >THIN SCRATCH-LIKE LINE RUNNING \
   25 DTI 12,3¬/2,12¬/37,3¬/FROM TOP TO BOTTOM NEAR THE CENTER OF \
   26 DTI 15,3¬/2,15¬/37,3¬/IMAGE IS A STATIC LINE.  <S>TATIC LINES \
   27 DTI 18,2¬/2,18¬/38,2¬/ ARE OCCASIONALLY PRODUCED IN THE \
   28 DTI 21,3¬/2,21¬/37,3¬/TRANSMISSION BETWEEN THE SATELLITE AND \
   29 DTI 24,3¬/2,24¬/37,3¬/THE RECEIVING STATION.\
   30 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
BRAN4
    1 PRR \
    2 DE  0¬/32\
    3 DT  0,0¬/2,0¬/40,0¬/<E>XAMINATION OF BOTH THE <W>INNIPEG \
    4 DT  3,0¬/2,3¬/40,0¬/SUMMER AND WINTER IMAGE,SHOULD HAVE \
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BRAN4
     5 DT  6,0¬/2,6¬/40,0¬/BROUGHT HOME TO YOU THE FACT THAT \
     6 DT  9,0¬/2,9¬/40,0¬/MANY OF THE CHANGES THAT TAKE PLACE \
     7 DT  12,0¬/2,12¬/40,0¬/FROM SEASON TO SEASON CAN ACTUALLY BE \
     8 DT  16,0¬/2,16¬/40,0¬/DETECTED AND ALLOW FOR QUICK COMPARISON.\
     9 DT  20,0¬/2,20¬/40,0¬/¬A   <I >WOULD LIKE TO REVIEW THIS SECTION:
           \
    10 DT  24,0¬/2,24¬/40,0¬/¬B   <P>UT THE NEXT SEGMENT ON THE SCREEN.\
    11 EPP ¬/BRAN4 -011\
    12 NX  \
    13 DT  28,0¬/2,28¬/40,0¬/<P>LEASE POINT TO ONE OF THE CHOICES.\
    14 CAP 4,20,40,0¬/C0\
    15 BR  SEG7\
    16 CAP 4,24,40,0¬/C1\
    17 BR  SEG8\
    18 UN  U2\
    19 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
SEG8
     1 PRR \
     2 DE  0¬/32\
     3 DT  0,3¬/2,0¬/40,0¬/<LANDSAT IMAGE ANALYSIS EQUIPMENT%%%%%%%%%%%
           %%%%%%%%%%%%%%%%%%%%%%> _____________________________________\
     4 DT  4,2¬/2,4¬/40,0¬/<T>O HELP YOU STRENGTHEN YOUR SKILLS IN \
     5 DT  7,0¬/2,7¬/40,0¬/<L>ANDSAT IMAGE INTERPRETATION, THE \
     6 DT  10,0¬/2,10¬/40,0¬/FOLLOWING IMAGE ANALYSIS EQUIPMENT IS \
     7 DT  13,0¬/2,13¬/40,0¬/AVAILABLE TO USERS ¬C¬O¬S¬T ¬F¬R¬E¬E AT THE
           \
     8 DT  16,0¬/2,16¬/40,0¬/<A>LBERTA <R>EMOTE <S>ENSING <C>ENTER, HERE
           \
     9 DT  19,0¬/2,19¬/40,0¬/IN <E>DMONTON.  \
    10 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    11 DE  0¬/32\
    12 DT  0,2¬/2,0¬/40,0¬/1. <T>RANSFERSCOPE - ENLARGES OR REDUCES \
    13 DT  3,3¬/2,3¬/40,0¬/IMAGES AND TRANSFERS DATA FROM IMAGE \
    14 DT  6,3¬/2,6¬/40,0¬/TO MAP, FROM MAP TO IMAGE, OR FROM \
    15 DT  9,3¬/2,9¬/40,0¬/IMAGE TO IMAGE.  \
    16 DT  13,2¬/2,13¬/40,0¬/2. <L>ANDSAT <I>MAGERY <V>IEWER - <A >32<X
           >\
    17 DT  16,3¬/2,16¬/40,0¬/ENLARGMENT VIEWER TO ASSESS <L>ANDSAT \
    18 DT  19,3¬/2,19¬/40,0¬/IMAGERY FROM MICROFICHE RECEIVED FROM \
    19 DT  22,3¬/2,22¬/40,0¬/THE <P>RINCE <A>LBERT RECEIVING STATION. EP
           I\
    20 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG8A
     1 PRR \
     2 DE  0¬/32\
     3 DT  0,2¬/2,0¬/40,0¬/3. <M>ULTISPECTRAL <V>IEWER - <A >VIEWER/ \
     4 DT  3,3¬/2,3¬/40,0¬/PROJECTOR/RECORDER/TRACER WHICH \
     5 DT  6,3¬/2,6¬/40,0¬/FACILITIES THE INTERPRETATION AND \
     6 DT  9,3¬/2,9¬/40,0¬/COLOR PRINT REPRODUCTION OF MULTIBAND \
     7 DT  12,3¬/2,12¬/40,0¬/IMAGERY.  \
     8 DT  16,2¬/2,16¬/40,0¬/4. <M>ICRODENSITOMETER - <A >32 COLOR \
     9 DT  19,3¬/2,19¬/40,0¬/DENSITY SLICER.  <A >T V CAMERA POINTED \
    10 DT  22,3¬/2,22¬/40,0¬/AT THE VARIOUS GREY TONES AND BRIGHT-\
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SEG8A
__   11 DT  25,3¬/2,25¬/40,0¬/NESS LEVELS OF AN IMAGE ARE CONVERTED \
__   12 DT  28,3¬/2,28¬/40,0¬/TO COLORS AND ARE DISPLAYED ON A <CRT>.\
__   13 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   14 DE  0¬/32\
__   15 DTI 0,0¬/2,0¬/40,0¬/5. <D>ATA <T>ERMINALS - <A>N ON-LINE TERMINAL
              \
__   16 DTI 3,1¬/2,3¬/40,0¬/LINKED TO THE <C>ANADA <C>ENTRE FOR <R>EMOTE
             \
__   17 DTI 6,1¬/2,6¬/40,0¬/<S>ENSING IN <O>TTAWA WHICH ALLOWS USERS \
__   18 DTI 9,1¬/2,9¬/40,0¬/AT ¬N¬O ¬C¬O¬S¬T TO OBTAIN TECHNICAL \
__   19 DTI 12,1¬/2,12¬/40,0¬/DOCUMENTS ON REMOTE SENSING AND DATA \
__   20 DTI 15,1¬/2,15¬/40,0¬/ON SPECIFIC <L>ANDSAT SCENES.  \
__   21 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__   22 DE  0¬/32\
BRAN5
__    1 PRR \
__    2 DE  0¬/32\
__    3 DT  0,0¬/2,0¬/40,0¬/<W>ELL THAT WAS CERTAINLY A BUNDLE OF \
__    4 DT  3,0¬/2,3¬/40,0¬/TECHNICAL JARGON!!  <H>OPE YOU \
__    5 DT  6,0¬/2,6¬/40,0¬/REMEMBERED IT ALL.  \
__    6 DT  16,3¬/2,16¬/40,0¬/¬N¬O    <I >FORGOT!  <S>OCK IT TO ME AGAIN.
             \
__    7 DT  24,3¬/2,24¬/40,0¬/¬Y¬E¬S   <I >REMEMBER-<I >WOULD LIKE TO GO
            ON.\
__    8 EPP ¬/BRAN5 -008\
__    9 NX  \
__   10 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
__   11 CAP 4,16,40,0¬/CO\
__   12 BR  SEG8\
__   13 CAP 4,24,40,0¬/C1\
__   14 BR  QUIZ6\
__   15 UN  U2\
__   16 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.  \
QUIZ6
__    1 PRR \
__    2 DE  0¬/32\
__    3 DTI 0,2¬/2,0¬/40,0¬/<W>HICH OF THE FOLLOWING ARE <E>XAMPLES OF\
__    4 DTI 2,2¬/2,2¬/40,0¬/IMAGE ANALYSIS EQUIPMENT?\
__    5 DT  8,2¬/2,8¬/40,0¬/¬A  <M>ICRODENSITOMETER\
__    6 DT  12,2¬/2,12¬/40,0¬/¬B  <T>RANSFERSCOPE\
__    7 DT  16,2¬/2,16¬/40,0¬/¬C  <M>ULTISPECTRAL VIEWER\
__    8 DT  20,2¬/2,20¬/40,0¬/¬D  <L>ANDSAT IMAGE VIEWER\
__    9 DT  24,2¬/2,24¬/40,0¬/¬E. <A>LL OF THE ABOVE\
__   10 DT  28,2¬/2,28¬/40,0¬/¬F  <N>ONE OF THE ABOVE\
__   11 EPP ¬/QUIZ6 -011\
__   12 NX  \
__   13 DTI 29,0¬/2,29¬/40,0¬/<Y>OU TOOK TOO LONG IN ANSWERING\
__   14 DTI 31,0¬/2,31¬/40,0¬/<T>RY ONE MORE TIME\
__   15 BR  RE\
__   16 CAP 4,23,40,0¬/CO\
__   17 DT  30,4¬/2,30¬/40,0¬/<C>ORRECT!\
__   18 WAP 14,7,40,0¬/W1\
__   19 DT  30,4¬/2,30¬/40,0¬/<Y>ES! BUT THAT'S ONLY ONE OF THEM\
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QUIZ6
    20 WAP 4,27,40,0¬/W2\
    21 DT  30,4¬/2,30¬/40,0¬/<N>O!  <T>HAT'S NOT RIGHT.\
    22 UN  U3\
    23 DT  30,4¬/2,30¬/40,0¬/<P>OINT TO ONE OF THE CHOICES ON SCREEN.\
    24 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    25 BR  SEG9\
    26 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG9
     1 PRR \
     2 DE  O¬/32\
     3 DTI 0,0¬/2,0¬/40,0¬/<THE CANADA CENTRE FOR REMOTE SENSING>\
     4 DTI 4,2¬/2,4¬/38,2¬/<T>HE '<CCRS>' WAS ESTABLISHED IN 1972 TO\
     5 DTI 6,0¬/2,6¬/40,0¬/FURTHER THE DEVELOPMENT AND USE OF \
     6 DTI 8,0¬/2,8¬/40,0¬/<R>EMOTE <S>ENSING.\
     7 DTI 10,2¬/2,10¬/38,2¬/<T>HE ACTIVITIES OF THE <CCRS >CAN BE \
     8 DTI 12,0¬/2,12¬/40,0¬/DIVIDED INTO FOUR CATEGORIES:\
     9 DT  17,0¬/2,17¬/40,0¬/1. <A>PPLICATIONS - UNDER WHICH NEW \
    10 DT  19,3¬/2,19¬/40,0¬/USES FOR REMOTE SENSING ARE DEVELOPED.\
    11 DT  23,0¬/2,23¬/40,0¬/2. <S>ATELLITE <O>PERATIONS - UNDER WHICH \
    12 DTI 25,3¬/2,25¬/40,0¬/SATELLITE DATA ARE RECEIVED,PROCESSED\
    13 DTI 27,3¬/2,27¬/37,3¬/AND DISTRIBUTED. \
    14 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
SEG9A
     1 PRR \
     2 DE  O¬/32\
     3 DT  4,2¬/2,4¬/40,0¬/3.  <R>ESEARCH AND <D>EVELOPMENT - UNDER \
     4 DT  6,0¬/2,6¬/40,0¬/WHICH NEW DATA ANALYSIS METHODS \
     5 DT  8,0¬/2,8¬/40,0¬/AND NEW SENSORS AND DATA ACQUISITION \
     6 DT  10,0¬/2,10¬/40,0¬/SYSTEMS ARE DEVELOPED, AND \
     7 DT  14,2¬/2,14¬/40,0¬/4.  <U>SER <S>ERVICES - UNDER WHICH \
     8 DT  16,0¬/2,16¬/40,0¬/FACILITIES AND TECHNICAL INFORMATION \
     9 DT  18,0¬/2,18¬/40,0¬/IS MADE AVAILABLE TO THE USER ON A \
    10 DT  20,0¬/2,20¬/40,0¬/ROUTINE BASIS.  \
    11 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    12 DE  O¬/32\
    13 DT  0,0¬/2,0¬/40,0¬/<THE ALBERTA REMOTE SENSING CENTER >\
    14 DT  2,0¬/2,2¬/40,0¬/OFFERS THE FOLLOWING FACILITIES ¬F¬R¬E¬E \
    15 DT  4,0¬/2,4¬/40,0¬/OF CHARGE TO ANYONE IN THE PROVINCE:\
    16 DT  8,2¬/2,8¬/40,0¬/1.  <I>NTERPRETATION EQUIPMENT\
    17 DT  11,2¬/2,11¬/40,0¬/2.  <E>DUCATION AND TRAINING PROGRAMS\
    18 DT  14,2¬/2,14¬/40,0¬/3.  <T>ECHNICAL INFORMATION SERVICE \
    19 DT  17,2¬/2,17¬/40,0¬/4.  <L>ANDSAT ORDER FACILITY\
    20 DT  20,2¬/2,20¬/40,0¬/5.  <I>MAGERY LIBRARY \
    21 DT  23,2¬/2,23¬/40,0¬/6.  <A>IRBORNE PROGRAM\
    22 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    23 DE  O¬/32\
    24 DT  4,4¬/2,4¬/40,0¬/<T>HE <A>LBERTA <R>EMOTE <S>ENSING <C>ENTER \
    25 DTI 7,0¬/2,7¬/40,0¬/CLOSELY COOPERATES WITH AND USES THE \
    26 DTI 10,0¬/2,10¬/40,0¬/FACILITIES OF THE <C>ANADA <C>ENTRE FOR \
    27 DTI 13,0¬/2,13¬/40,0¬/<R>EMOTE <S>ENSING IN <O>TTAWA.  <T>HE <C>E
        NTER \
    28 DTI 16,0¬/2,16¬/40,0¬/IS ALSO IN CLOSE CONTACT WITH REMOTE \
    29 DTI 19,0¬/2,19¬/40,0¬/SENSING AGENCIES THROUGHOUT <N>ORTH \
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SEG9A
__  30 DTI 22,0¬/2,22¬/40,0¬/<A>MERICA.\
__  31 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  32 DE  0¬/32\
__  33 DT  6,2¬/2,6¬/40,0¬/<T>HE <A>LBERTA <C>ENTER FOR <R>EMOTE <S>ENSI
            NG \
__  34 DTI 9,0¬/2,9¬/40,0¬/IS LOCATED AT :\
__  35 DT  14,0¬/2,14¬/40,0¬/9820 106TH <S>TREET,\
__  36 DTI 17,0¬/2,17¬/40,0¬/<E>DMONTON, <A>LBERTA,\
__  37 DTI 20,0¬/2,20¬/40,0¬/<T>ELEPHONE (403) 427-2381\
__  38 DTI 23,0¬/2,23¬/40,0¬/<C>ONTACT <M>R. <C>AL <B>RICKER \
__  39 DTI 26,0¬/2,26¬/40,0¬/<C>OORDINATOR.\
__  40 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
BRAN6
__   1 DE  0¬/32\
__   2 DT  0,0¬/2,0¬/40,0¬/<N>OW THAT WE HAVE COVERED THE VARIOUS \
__   3 DT  3,0¬/2,3¬/40,0¬/<R>EMOTE <S>ENSING AGENCIES,WOULD YOU LIKE \
__   4 DT  6,0¬/2,6¬/40,0¬/A MINI%%%%____ REVIEW?  \
__   5 DT  16,3¬/2,16¬/40,0¬/¬Y¬E¬S   <G>IVE ME THE MINI REVIEW.  \
__   6 DT  24,3¬/2,24¬/40,0¬/¬N¬O    <L>ET ME CONTINUE.\
__   7 EPP ¬/BRAN6 -007\
__   8 NX  \
__   9 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
__  10 CAP 4,16,40,0¬/C0\
__  11 BR  SEG9\
__  12 CAP 4,24,40,0¬/C1\
__  13 BR  SOURCE\
__  14 UN  U2\
__  15 DT  28,0¬/2,28¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
SOURCE
__   1 PRR \
__   2 DE  0¬/32\
__   3 DT  0,0¬/2,0¬/40,0¬/<I>NTERESTED IN GETTING FURTHER \
__   4 DT  3,0¬/2,3¬/40,0¬/INFORMATION ABOUT <R>EMOTE <S>ENSING?  \
__   5 DT  6,0¬/2,6¬/40,0¬/<T>HE FOLLOWING INDIVIDUALS AT THE \
__   6 DT  9,0¬/2,9¬/40,0¬/<U>NIVERSITY OF <A>LBERTA CAN BE CONTACTED.\
__   7 DT  12,2¬/2,12¬/40,0¬/<D>R. <J>OSEPH <K>IRMAN\
__   8 DT  14,2¬/2,14¬/40,0¬/<P>ROFESSOR OF <E>DUCATION\
__   9 DT  16,2¬/2,16¬/40,0¬/<D>EPT. OF <E>LEMENTARY <E>DUCATION\
__  10 DT  21,2¬/2,21¬/40,0¬/<M>R. <L>EE <G>. <A>RMSTRONG\
__  11 DT  23,2¬/2,23¬/40,0¬/<G>RADUATE <S>TUDENT\
__  12 DT  25,2¬/2,25¬/40,0¬/<D>EPT. <O>F <E>LEMENTARY <E>DUCATION\
__  13 DT  27,2¬/2,27¬/40,0¬/<R>OOM 951A <E>DUCATION <S>OUTH\
__  14 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
<L>AST
__   1 DE  0¬/32\
__   2 NO  COPY¬/DRW2BM-2¬,DRW2BM-27¬,SDRAW-1\
__   3 CM  DRW2BM¬/0¬,0\
__  27 NO  EM\
__  28 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
__  29 DE  0¬/32\
__  30 NO  COPY¬/DRW2CR-2¬,DRW2CR-39¬,SDRAW-1\
__  31 CM  DRW2CR¬/0¬,0\
__  58 NO  EM\
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<L>AST
    59 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    60 DE  0¬/32\
    61 DE  0¬/32\
    62 FN  XP¬/2¬/16¬/2¬/<CONGRATULATIONS>\
    63 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    64 DE  0¬/32\
    65 NO  COPY¬/DRWMDG-2¬,DRWMDG-55¬,SDRAW-4\
    66 CM  DRWMCP¬/0¬,0\
   116 DTI 28,25¬/2,28¬/15,25¬/<GREAT WORK>!!!\
   117 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
   118 DE  0¬/32\
   119 DT  6,0¬/2,6¬/40,0¬/<Y>OU HAVE JUST COMPLETED THE COURSE!!!\
   120 DT  9,0¬/2,9¬/40,0¬/<B>EFORE YOU SIGN OFF, YOU WILL BE GIVEN \
   121 DTI 12,0¬/2,12¬/40,0¬/THREE OPTIONS TO CHOOSE FROM.  \
   122 DTI 15,0¬/2,15¬/40,0¬/<T>HE OPTIONS WILL APPEAR ON THE NEXT \
   123 DTI 18,0¬/2,18¬/40,0¬/SCREEN DISPLAY.  <P>LEASE USE THE \
   124 DTI 21,0¬/2,21¬/40,0¬/LIGHT PEN TO POINT TO YOU PARTICULAR \
   125 DTI 24,0¬/2,24¬/40,0¬/CHOICE.\
   126 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
   127 DE  0¬/32\
<L>AST2
     1 PRR \
     2 DE  0¬/32\
     3 DTI 10,3¬/2,10¬/40,0¬/¬A.  <S>IGN OFF NOW AND TAKE AN IN-CLASS \
     4 DTI 12,7¬/2,12¬/40,0¬/EXAMINATION.\
     5 DTI 16,3¬/2,16¬/40,0¬/¬B.  <G>O BACK AND REVIEW THE SECTION ON \
     6 DTI 18,7¬/2,18¬/40,0¬/<L>ANDSAT IMAGE INTERPRETATION,THEN
             THEN                , THEN       AND THEN \
     7 DTI 20,7¬/2,20¬/40,0¬/TAKE THE IN-CLASS EXAMINATION.\
     8 DTI 24,3¬/2,24¬/40,0¬/¬C.  <R>EVIEW THE ENTIRE COURSE BEFORE \
     9 DTI 26,7¬/2,26¬/40,0¬/TAKING THE FINAL EXAMINATION.\
    10 PRR \
    11 EPP ¬/<L>AST2 -011\
    12 NX  \
    13 DT  28,0¬/2,28¬/40,0¬/<P>LEASE POINT TO ONE OF THE CHOICES.\
    14 CAP 4.10,40,0¬/C0\
    15 BR  FINIS\
    16 CAP 4,16,40,0¬/C1\
    17 BR  SEG5\
    18 CAP 4,24,40,0¬/C2\
    19 BR  UA2END\
    20 UN  U3\
    21 DT  30,0¬/2,30¬/40,0¬/<P>OINT TO ONE OF THE CHOICES.\
FINIS
     1 PRR \
     2 DE  0¬/32\
     3 NO  COPY¬/DRWAYZ-2¬,DRWAYZ-7¬,SDRAW-4\
     4 CM  DRWAYZ¬/0¬,0\
    10 NO  EM\
    11 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    12 DT  24,0¬/2,24¬/40,0¬/¬T¬H¬E ¬E¬N¬D\
    13 EPI 30,39¬/2,30¬/1,39¬/¬/1¬/ZZ\
    14 EN  \
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